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Notes on the Early History of the Veterinary Surgeon in England.*

By Fred Bullock, LL.D.

The field of Veterinary History has been so thoroughly garnered by Major-General Sir Frederick Smith as to make it difficult to do more than glean here and there. It was my privilege to be associated to some slight extent with his *Early History of Veterinary Literature and its British Development*, and that experience gave me—who am neither veterinary surgeon nor historian—an interest in the subject. In the following pages I have constantly referred to Sir Frederick Smith's work.

When the Latin author Columella wrote his *De Re Rustica* about the time of the second invasion of Britain, he described the medicine of animals under the new term "medicina veterinaria," but makes no mention of the shoeing of horses. By A.D. 110, however, the Roman Army had a *veterinarium*, with a forge attached to it. Its place in the camp is described by Hyginus Gromaticus (*Liber de Munitionibus Castrorum*, 21, §22). It was a hospital for sick and wounded horses and other animals. If, however, before the Romans left Britain in A.D. 400, "medicina veterinaria" was practised in this country, no evidence of it remains; nor did the "veterinarius" or veterinary surgeon, if he existed here in Roman days, answer to that name again for 1400 years.

The Ancient Laws of Wales show that in the tenth century such equine diseases as staggers, strangles, farcy, worms and restiveness, such cattle diseases as scabies, rot and redwater were known. The horse is to be warranted against the staggers for three dew-falls, against the black-strangles for three moons, and against the farcy for one year. In the case of mange the purchaser must swear that he put the animal on a clean pasture and in a stable in which there had not been mangy animals for seven years. One need not suggest that it was a veterinary surgeon who would be called in to give his certificate of soundness in the tenth century, but when the claim under the warranty was made some expert person would doubtless be consulted to settle whether the disease was the one warranted against. It was also specified in the Laws that payment must be made to one who gives a remedy *to a man or to an animal*. This seems to show that human and animal medicine were the work of the same leech.

In the Anglo-Saxon Leechdoms, which contain a number of veterinary references, there is no separation of them from the general body of medical matter.

After the Conquest all is dark for a while, but the growth of chivalry with the Crusades must certainly have given a great impetus to equine medicine and surgery. The Chevalier or Knight was the fully equipped feudal tenant on horseback. He made it his pride that he could shoe his horse and treat it in disease. It is in this period of the heyday of chivalry (1200 to 1500) that the doctor of horses separated off as a specialist from the general practitioner, much as the surgeon and dentist separated off. We now meet with a new term to describe the doctor of horses, namely, *Marshal*, his profession being that of *Marshalsy*. All the great houses of the Nobles would certainly have their marshals and smiths as part of their domestic establishment.

The origin of this word is Teutonic, Old High German *Marah-skalh*, the "horse-groom," which became in Italian *mariscalco*, *maliscalco*, and *maniscalco*, and in Old French *mareschal*, from which we get the English *marshal*. This word ousted the Latin *veterinarius* for several centuries. Doubtless it came into use during the German invasion, grew into importance during the Crusades, and secured a new vogue under the influence of Jordanus Ruffus, the Master Marshal of Frederick II, the *Stupor Mundi*. This great German Emperor, King of Sicily from 1216 to 1250, a student of zoology and of medicine, the most accomplished sovereign of the Middle Ages, was keenly interested in veterinary medicine, and encouraged his Master Marshal to produce a work on this subject. So Ruffus, himself styled *imperialis marescallus major*, wrote, with Frederick's help, a treatise commencing "Izi cominza lu libru di manischalchia compostu do lu maestro Giordano Ruffo . . . mariscalco del imperatore Federicu." This work had an immense vogue. It was copied and translated into many languages, and we possess in the British Museum at least three different mediæval manuscript copies, viz., Harl. 1637, 3535, and 3772. The *veterinarii* of Rome now became *mariscalci*, and *ars veterinaria* became *marescalcia*.

Very soon we meet with "marshals" in England. The earliest reference seems to be in Wace's *Chronicle*, 1330, but the Master Marshals there referred to appear to be no more than horse-grooms. In 1356, however, the Master Marshals of London obtained an ordinance from the Mayor and Alderman, giving them authority to rule the craft. Riley, in his translation of this Ordinance, writes "Master Farriers" for "les bons genes mestres máreschals," but as the word "marshals" was already in full use, it seems proper to retain it here. The Ordinance itself shows too that there was already a distinction between the craft of shoeing, and the "mestier" of "marchalcye des chivaux."

It is interesting to note in passing that the good folks of the trade agreed with the Masters "that they will well and loyally advise all those who shall ask counsel of them as well in the purchase of horses as in their cure . . . and that no one of the said trade shall commence or undertake any great cure if he does not reasonably see at the beginning that the same cure will be brought to a good end; and that if any person shall undertake any great cure and shall fear in his conscience that the same will take a disastrous turn, then in such case he shall come before the masters and other

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wise men of the said trade to ask their counsel and aid for the saving of the horse and for the profit of him to whom the horse belongs and the honour of the said trade." . . . "And if the contrary be found or it shall be proved against any person that through negligence he has let such horse perish, then he shall be accused thereof before the Mayor and Aldermen and be punished at their discretion in the way of making restitution for such horse to the person to whom the same belongs."

The rule as to consultations in difficult cases was similar to that found in the contemporary Surgeons' Gild, but the surgeons did not have to make restitution for the patients they lost! Those who took up animal surgery found this great obstacle always before them, and to-day the progress of veterinary medicine is handicapped by the fact that the surgeon is, as a rule, not allowed to treat a case unless it is economically worth treating. On the other hand, there have been those who have been thankful that their patients had no soul to be saved, saying "For if they had, the Lord have mercy on us all!"

Shortly after the Marshals' Ordinance of 1356, we find a case in the Year Books where a Marshal was sued for negligence in treating a horse, by reason of which the horse died.[1] Again, in 1441, we find the record of a writ against R. Mareshall for that he "assuma sur lui a Londres a curer un cheval d'un certein maladie et qu'il adeo negligenter et improvide imposuit medicinas suas, etc., quod equum, etc., interfecit."[2]

In an earlier case, brought in 1374, against a surgeon with the ominous name of J. Mort, who had, it was alleged, negligently treated an injured hand, it was argued, "If I deliver my horse to a farrier to shoe, and if he pricks my horse, I shall have a writ of trespass against him, or if my horse is wounded by being pricked with a nail, and I deliver him to a Marshal to cure, and by his negligent treatment my horse is maimed, I shall have a writ on the matter."

It is clear, therefore, that at this date, 1374, there is a distinction between the Farrier or Smith who shoes the horse and the Marshal who treats the horse for injuries.

The name *Marshal* for the doctor of horses, and *marshalcy* for his profession, persisted certainly until the eighteenth century. The *New English Dictionary* gives examples from 1389 and 1430, and one from 1506 in the Lord Treasurer's Accounts, Scotland, shows its usé as a verb: "Item, to deif Andro, that marshalit foure horse to the King."

That the marshals were of considerable importance in the life of the City is evident from the precept issued by the Mayor and Aldermen of London in 1431, directing the sheriffs that they must not summon any "marescallos equorum" to serve on juries, except in cases of urgent necessity.

At this period, the fifteenth century, there were in circulation a number of treatises on Marshalsy. In Mrs. Singer's list of Medical MSS. there are several in Latin, French and English. The following titles in English are the most interesting for our present purpose:—

British Museum. Harl. 6398, the Boke of Marchalsi.

Cambridge (219) Dd. iv. 44, "This is the marchalcie of Piers Moritz"

Oxford, Ball. Coll. Cod. 354 (vii), "The Book of merchalcie or Treatise on the breaking and managing of horses with medicines and modes of treating them in illness."

Oxford, 8608 (1697 cat.), "The book of merchalsy for curing horses of maladies."

Harl. 6398 is a copy of the same work as Harl. 5086, and these appear to be the earliest English MSS. in which the word "marshalsy" occurs. The work itself is analysed by General Smith in Vol. I of his *History* and judged to be of poor quality, not comparable to that of Jordanus Ruffus.

Fitz Herbert, who wrote a celebrated *Boke of Husbandrie* (*circa* 1523), described the veterinary practitioner of his day as "horse-leach," he that taketh upon him to cure and mend all manner of diseases and soraunces that horses have," but he does not seem to have had a very good opinion of him, or for that matter of the contemporary apothecary. He himself writes well on the diseases of horses, cattle and sheep, and was the first to ascribe liver fluke to the presence of snails in the pastures.

Henry VIII, during whose reign several acts were passed prohibiting the export of horses, and providing for the better breeding of horses, brought into the country, in order to take charge of the Royal Studs, the famous Italian Master Marshal Hannibal, spoken of for centuries after as a great horse leach. As Serjeant Farrier he would have on occasion to assist the Serjeant Surgeon at the gruesome State punishment by mutilation as provided for by Act 33 Henry VIII, c. 12 (1541).

Under Elizabeth we know that Martin Hollyman or Alman served as Serjeant Farrier, being in charge of the studs at St. Albans, and Richard Snape as Yeoman Farrier.[3] In this reign, Thomas Blundeville published his *Fower chiefest Offices of Horsemanshippe* (1565), but does not speak of Marshals, describing the practitioner as "Keper and Ferrer." Neither does he use the word "veterinary," though the work of Vegetius, *De arte veterinariæ sive mulomedicinæ*, had been published at Basel in 1528. Blundeville made use of some of the old English treatises in MS. to which we have referred and borrowed a good deal of information from the aforesaid Martin Alman, whom he describes as "Chief Ferrer to the Queen's Majesty," and "the most skilful ferrer that I know in all England." That "ferrer" was used by Blundeville to mean a general practitioner in veterinary medicine is clear from the account of diseases which the Ferrer is expected to treat, and from the fact that he still makes a distinction between the smith who shod horses and the Ferrer who treats them for diseases and injuries. But Martin Alman is described in the Accounts of the Progresses and Public Processions of Elizabeth (1559-1569) as "Marshall Ferrer," an account of his for "curing and dressing the Queen's horses" being listed. T. Clifford in his *Schoole for Horsemanshippe* (1585), speaks of that "famous Marshal Martine Alman," and the Duke of Newcastle in his great work of horsemanship (1667), calls him "Prime Marshal to Queen Elizabeth, an excellent Farrier." In the Accounts of the Reign of Charles I[4] is a bill of one of His Majesty's Farriers, for "marshalling His Majesty's Hunting Horses for the year 1626," but by now the title "Farrier" was ousting that of "Marshal"

[1] *Y. B.*, 43 Ed. III, f. 33, pl. 38 (1369).
[2] *Y. B.*, 10 Hen. VI, f. 48, pl. 5.
[3] Letter from R. S., Lambeth Library, dated 30 July, 1594.
[4] Hore, *History of Newmarket*, ii, 6.

Our military Annals show that in 1591 the "skilful Ferrar" who could judge of lameness and soundness was needed by the Muster Masters who conscripted for the Army.[5] In the famous law case of Powtuary v. Walton (1597) it was laid down that "si un farrier assume sur lui a curer mon cheval que est gravelled en ses pieds, & puis ita negligenter et improvide heald le dit cheval que ceo morust" there will be an action for negligence. Nevertheless, the "Marshal" does not quite disappear for another century.[6] In 1678 Sir W. Hope published his *Parfait Mareshal or compleat Farrier*, and in 1639 Thomas De Grey, in his *Complete Horseman*, speaks of the "skilful ferrier or marshal" as being one most expert in horseleech craft, as distinguished from the "empyreticall horse leach." Even as late as 1720 Gibson, in his *Farrier's Guide*, still speaks of Marshals. Only once in this period do we meet with the term "Veterinarian," and that is when Sir Thomas Browne compares "common farriers" with "good veterinarians" (*Pseudodoxia Epidemica*, 1646).

It is clear that the Veterinary Surgeon of this period was both shoeing-smith and surgeon. Hexam (1637) describes the duties of the Army Farrier as "to drench and lett bloude the horse of the troupe, and alwaies, either upon a march or in quarter, to have in readiness his buggett of tools, horse shoes and nailes, whensoever he shall be called upon by his officers, or when any gentleman of the troupe shall have use of him, and for this reason that he must duly attend upon the Troupe he is freed from other duties and hath a greater paye than an ordinary horseman."[7]

In 1674 the Master, Wardens and Fellowship of the Craft and Mystery of Farriers of London secured a charter from Charles II on the ground that their "Art and trade is of great antiquity and of great use and benefit to our subjects for preserving horses, and that divers inexpert and unskilful persons . . . have taken upon them to practise and have destroyed many horses." . . . The Charter established the Company of Farriers of London, with rules similar to those for Barber Surgeons. Power was given to the Company under certain safeguards, to visit shops, cellars and stables, and to search for any defective works, medicines and ingredients used, and to take action against offenders. Andrew Snape (senior), Serjeant Farrier to Charles III, was in 1675 Master of the Company. He is also described in the State Papers as "Marshal Ferrier." His son Andrew, also a Member of the Farriers' Company, who claimed that his family had occupied the position of Farrier to the King for 200 years, was the author of an elaborate *Anatomy of an Horse* (1683), the first work of its kind in English.

During the eighteenth century we find Farriers treating horses, and cowleeches and cattle doctors treating cattle, sheep and pigs. They all, no doubt, were "hereditary" doctors, with recipes handed down from father to son, and they probably also made use of the wretched books published by Gervase Markham and his imitators. But in this century a number of medical men and others gave some study to the subject, and wrote books mainly on the diseases of horses, though the Cattle Plague of 1714 and 1745 brought out a few writers on diseases of cattle, *e.g.*, T. Bates, F.R.S., 1717, Cromwell Mortimer, M.D., 1745, Richard Brocklesbury, M.D., 1746, E. Litton, 1750, D. P. Layard, F.R.S., 1757. The most important work was probably Sir William Hope's translation of Solleysel's *Parfait Mareschal* at the beginning of the century, in which, by the way, Hope described himself as a lover of Marshalry and Horsemanship.

Those who wrote on the diseases of horses usually spoke of the subject as Farriery, their books being entitled, as a rule, *The Gentleman's Farriery*. Among these we may note John Wood, who though he claimed "a natural genius for farriery" was not a member of the Farriers' Company and was very ignorant of the subject. He is noteworthy, however, for having in 1758 published a proposal to establish a hospital for horses for the public benefit. Among the subscribers to his book I find, in addition to the names of five London Farriers, the name of Sergeant Surgeon Ranby. Wood's proposal does not appear to have matured. The Farriers' Company was, however, like the College of Physicians at this time, more interested in keeping their circle closed and the entrance narrow, than in enlarging it, allowing the introduction of new men with new ideas. This is shown by their treatment of Wm. Osmer, a surgeon who, with his brother, "undertook the cure of horses in the various complaints, and having them shod in the proper manner." He declares in his *Treatise on the Diseases and Lameness of Horses* (1759) that his intention is to extricate the Science of Farriery from the hands of the ignorant and illiterate. Having issued some chapters of his book dealing with the Foot and Shoeing, to show the utility of his work, he says it was "tried and condemned in an august assembly as a matter of no use or benefit." Sir F. Smith[8] suggests that the august assembly was the Jockey Club. Since that volume was written I have discovered in the Archives of the Farriers' Company evidence which shows that Osmer was also "tried and condemned" by the Worshipful Company of Farriers. Though Osmer was, as General Smith says, probably superior to all his predecessors in his knowledge of the cause of lameness in horses, the fact that he dared to open a forge and to shoe horses as well as to treat them for diseases caused the Court of the Company to resolve on November 10th, 1766, to prosecute him for carrying on business as a Farrier in Oxford Street, not being free of the Company. They sold out £25 of their South Sea Stock to meet the costs of the suit, but on April 2nd, 1767, the Master reported to the Company that they had been non-suited for want of sufficient evidence.

It is rather a humorous situation—Osmer on his side declaring that the farriers are illiterate, hidebound, prejudiced in favour of their antiquated methods, cruel in many of their remedies, and offering them a better way; on the other side the Company, seeing their craft in danger, appealing to the Court, only to be treated like Demetrius the silversmith, at the hands of the Town Clerk of Ephesus, though not quite with so much celerity.

The attitude of the Company to Osmer was but in keeping with a decision which had been taken as early as 1762, when they received a request from several noblemen "and gentlemen of the First Distinction" who had "suffered by the ignorance of unskilful quacks who assume

[5] Smith *Hist. R.A.V.C.*, p. 5.
[6] Gervase Markham left on his death in 1637 an unpublished MS. entitled "Le Mareschale or Horse Marshal." Smith, *Early History of Veterinary Literature*, 1919, I, p. 236.
[7] Smith, *Hist. R.A.V.C.*, p. 6.
[8] Vol. II, p. 88.

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to themselves the name of Farriers" to take action against all "foreign" farriers. Those who, after warning, did not join the Company were compelled to shut up shop. But unfortunately there was no attempt on the part of the Company to institute a better system of education and training for their members, and they were apparently averse to any such move. Edward Snape, who was a member of the Company and Farrier to George III, proposed, however, in 1765 to establish in London a Hippiatric Infirmary "for the instruction of pupils in the Profession," but he received no encouragement from the Company. When, in 1778, he did establish his Infirmary, it was not a success.

During the latter part of the eighteenth century there appears to have been a considerable demand for veterinary knowledge, for the works of the writers of *Gentlemen's Jockeys* and *Pocket Farriers* ran into edition after edition. William Taplin, a surgeon, sailed on this tide into a fortune by selling medicine for horses by agencies all over the kingdom and advertising them by means of his books. The calls on the services of the few men who were capable of treating horses' diseases must have been very heavy. The poor horse suffered both from bad roads and bad shoeing, and once the feet were done the horse was done.

But a new era was at hand. When the attempts of Wood and Snape to establish a veterinary school fell through, the Odiham Agricultural Society in 1785 began to discuss "what were the most likely means to encourage the study of scientific farriery." In 1788 and 1789 they published an appeal in which, lamenting "that there is not yet in England any establishment adequate to the desired improvement in Farriery by a regular education in that science on medical and anatomical principles," they expressed their intention, if sufficient funds were raised, to send two or more students to be trained at the Alfort School near Paris. In 1789, however, Charles Vial de Sainbel came to England and issued proposals for reading lectures on the general knowledge of the horse, and in the following year he published a *Plan for establishing an Institution to cultivate Veterinary Medicine.*

It was this plan which ultimately displaced the project of the Odiham Society. It is well to notice that the Odiham Society speaks of "Farriery," Sainbel speaks of "Veterinary Medicine." A general Meeting of subscribers to the proposed Veterinary College was held in April, 1791, when Officers were elected and regulations made for the constitution and organisation of the College. The Odiham Society, on hearing of the actual establishment of the College, very magnanimously decided to drop their project; they sent on all their papers to the new College, and directed the subscribers to their fund to transfer their subscriptions to the new Institution.

Among the most active supporters of the College was John Hunter, who was described as "the life and soul of the undertaking." He was a Vice-President, and other Vice-Presidents included Sir Joseph Banks, P.R.S., and Sir George Baker, Bt., F.R.S. The curriculum was to cover a three years' course in Anatomy, the Exterior of the Horse, and external diseases, Materia Medica, Pharmacy, Botany, Shoeing, Pathology, Medicine, Surgery, Epizoötic Diseases; and, when the pupils had completed their studies, and had undergone a public examination in the theory and practice of every branch of the veterinary art, they were to receive a certificate if they were considered as perfectly instructed therein.

In the prospectus of the school, issued in 1793, the following paragraphs occur which are believed to be from the pen of John Hunter:

"The incompetency of the persons to whom (the veterinary art) has been abandoned, has drawn contempt upon the art itself, and few have ventured to concern themselves with a profession that seemed incapable of conferring any honour upon those that exercised it. . . .

"It requires the sacrifice of as many years to become a skilful veterinarian as to become a skilled physician; the acquisition of the science and the practice of each is a task sufficient to engage one man's life, and the contrary opinion is a portion of that ancient error which, while medicine was regarded as the province of the learned and the few, supposed the veterinary art on a level with the most ordinary capacities."

The English School, therefore, began under good auspices, but it soon fell on evil days. Sainbel died in 1793, and though John Hunter quickly arranged for the students to attend lectures at his own theatre and those of other eminent teachers in London, the tragic death of Hunter himself speedily followed.

While the London school was limping along under the crippling influence of Coleman another school was founded by William Dick in Edinburgh in 1823. This grew rapidly, and in many respects outstripped the London school. The rivalry of the two schools did not tend to the growth of a united profession, and very soon the veterinary practitioners began to urge the establishment of a single body to govern the profession. Nothing could be done while Coleman was alive, but meetings to this end began in 1841, and in 1844 a Royal Charter was obtained establishing the Royal College of Veterinary Surgeons, to consist of the graduates of the two existing schools and of any other schools which should be affiliated to the Royal College by Royal Sign Manual. The examinations were to be conducted by the new body, which was to appoint the examiners, control the curriculum, and award the diploma.

A Board of Medical and Veterinary Examiners was appointed, and it may interest this Society to know that the medical examiners included such men as W. T. Brand, Bransby Cooper, Robert Liston, Robert Knox, John Lizars, William Babington, S. Solly, and later Richard Quain, William Sharpey, and Alfred S. Taylor.[9]

Veterinary science was now a speciality. Up to this time I venture the suggestion that in England physicians and surgeons had attended to the injuries and ailments of animals when the occasion arose. All gentlemen were horsemen in those days at any rate, and the educated physician or surgeon would no doubt try his own treatment with his favourite horse, or with his friend's horse, though he might condescend to listen to the advice of the horse-leach. The physician would frequently be mystified by the varying response to treatment his animal showed in the case of remedies the effect of which on man he knew well, but it would never have paid him to go very deeply into the matter. He sold his horse and got a fresh one. And so, as Hunter said, "Veterinary science was aban-

[9] Since those days there have been James Syme, Alex. Crum-Brown, W. H. Flower, William Turner, J. Burdon Sanderson, J. G. McKendrick, W. D. Halliburton, Sims Woodhead, and Noël Paton.

doned," much as surgery had once been abandoned, to anybody who cared to spend his time unprofitably upon it.

The human subject clamoured for treatment, and the demand created the supply. "Skin for skin," said Satan to Jehovah, "Yea all that a man hath will he give for his life," and so the study of human medicine was profitable. But the dumb animal only got attention when the pocket of the owner was threatened, for it was not until last century that kindness to animals and care for their well-being became a duty generally recognised. After the good beginning made by Frederick II in the thirteenth century, it is somewhat shameful that little more was done in Europe towards encouraging veterinary science till the end of the eighteenth century, and that until the beginning of the twentieth century no veterinary school received any financial assistance either from the public or from Government, apart from the one public effort of 1791.

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A Clean Milk "Record"?

Captain A. C. Wilson, M.R.C.V.S., of Berkhampsted, forwards us the following communication, with the enquiry: "Is this a 'record'"?

Lodge Farm,
Wigginton,
Nr. Tring.
April 22nd, 1929.

Dear Capt. Wilson,—Knowing your interest in the subject of clean milk production, I thought the following might be of interest to you. A sample of milk recently taken from my herd (under surprise conditions) by the authorities running the Hertfordshire Clean Milk Competition (1929) shewed a bacterial count of 20 bacteria per c.c., coliform organisms being absent. The sample kept sweet under test for a period of 97 hours.

Yours faithfully, S. R. W. Wilson.

The Physiology of Ruminant Digestion.*

By J. Hammond, M.A., School of Agriculture, Cambridge.

In writing this paper the object has been to picture in broad outlines the problems of ruminant digestion and to state opinions drawn from physiological, biochemical and practical knowledge which it was hoped might stimulate further scientific and practical investigation of the problems concerned. My thanks are due to many friends in these various fields of work who have given me the benefit of their experience in discussion, while I am especially indebted to Scheunert's account of the physiology and biochemistry of ruminant digestion.

Development. To understand the physiology of the ruminant stomach, one wants to know something of its evolution and development. The spacious rumen probably developed (as the crop in birds) so that food, especially bulky food, could be gathered in haste and digested at leisure and so render the species more immune to the attacks of carnivorous animals. The omasum, or third stomach, has also, like the gizzard of birds, become specialised to deal with food substances surrounded by fibrous coverings. In the newly-born calf and lamb the first three stomachs are comparatively undeveloped and functionless and digestion proceeds, while mother's milk is the sole nutriment, as in the simple-stomached animal. As the young animal grows up the first three stomachs begin to develop and function, and the diet of the animal gradually changes from a watery concentrated food (milk) to a bulky diet generally rich in fibre. The development of the first three stomachs is normally a gradual process, but can be hastened or retarded according to the type of food fed. Many calves are caused to be "pot-bellied" by feeding too much bulky food, this developing the rumen and slowing down the process of digestion at a time when the growth requirements of the body for nutrition are great and concentrated food is required to supplement the milk as it is gradually withdrawn. In some districts where much coarse hay and straw are fed the cattle have a "paunchy" appearance (Red Danish) and often stunted form, while in others when young grass, good quality hay and silage are used (Friesland) the cattle are well grown and straight sided. Where appearances do not matter and when only milk is being produced, a large paunch or "big barrel" on a cow is an advantage in that it gives her a large stomach capacity to deal with larger amounts of dry matter daily. In rearing dairy heifers, therefore, a certain amount of coarse fodder in the ration is desirable; not so much as to stunt growth, but enough to encourage the development of a barrel, so that when she comes into milk the space so formed may be occupied by more concentrated food for productive purposes. In developing meat animals or showyard types of milking animals, on the other hand, where early maturity is required, the bulk in the ration has to be cut down in order to get sufficient surplus of nutrition for production of a carcase at an early age.

According to Wester, the changes which occur in the stomach as the animal grows up are as follows:—In the

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suckling calf the œsophagus is continued by means of the lips of the œsophageal groove which at this time, by means of a reflex, forms a tube carrying the milk direct to the fourth or true stomach. With growth the first three stomachs develop quickly, while the œsophageal groove gets left behind in development, so that it can no longer close and milk in increasing quantities enters the first three stomachs. He believes that in adult life the lips of the œsophageal groove are comparatively atrophic and the reflex is gradually lost, so that it is unable to conduct fluid directly into the third stomach any longer. This is contrary to the view often held that the bolus after rumination goes directly to the third stomach by way of the œsophageal groove, because it is then in a very fluid condition; but it has been found that in adult life, even when the maximal contraction of the lips of the œsophageal groove has been produced by pilocarpine, it cannot conduct fluid but all falls into the reticulum.

The relative sizes of the parts of the stomach vary with age in correlation also with the nature of the food. In cattle at birth the rumen and reticulum together are about half as large, while at 10 weeks they are twice as large, as the abomasum; the omasum appears to be contracted and functionless. At four months old the rumen and reticulum together are about four times the size of the omasum and abomasum together, while at 1½ years the omasum about equals the abomasum in capacity and mature proportions are reached: these are as follows:—

TABLE I.

		Rumen.	Reticulum.	Omasum.	Abomasum.
Capacity — litres	Ox	140—200		14—18	8—20
	Sheep	13	1	0·3	1·75
% Capacity	Ox	80	5	7 or 8	8 or 7
	Sheep	81	6	2	11

GENERAL NUTRITION (Food Requirements). While the wild cow could afford to be leisurely in the digestion of its bulky food, for it had nothing to produce except a calf, the modern high-milking cow, producing 1,000 gallons or more of milk in the year, makes considerable demands for nutrition from the digestive tract and the leisurely process has to be speeded up if her genetic capabilities for milk production are to be made use of, or else she will milk the flesh off her bones and soon become the prey of disease.

The nutritives absorbed by the digestive tract are used for two purposes:—(*a*) For maintenance, to supply the energy and repair for wear and tear of the vital processes (circulation, respiration, etc.); and (*b*) for production, to supply the energy necessary for growth and milk production. Milk production, occurring as it does periodically in the life of the animal, throws considerable strain on the nutritive reserves of the body at these times unless the rate of absorption of foodstuffs is temporarily increased. The chief storage made by the body is fat and while this can be drawn on to supply energy in times of starvation, in the wild animal it is unsuited to the requirements of high milk production where large supplies of protein are required; consequently we find that owing to the lack of knowledge in the methods of speeding up ruminant digestion the constitutions of high-producing cows are frequently undermined.

As there is no great storage of proteins in the body the total amount of protein digested has to be more than equal to the total amount produced in the milk each day. With our modern high-producing animals, therefore, it is the speed of digestion which is the important factor in feeding. The leisurely digestion of the wild ruminant has to be speeded up in order to obtain high production and this can be done in various ways.

The foodstuffs may be classified into (*a*) bulky foods or roughages (such as hay and straw), containing a small amount of nutrient material in a large bulk, the bulk consisting of fibre or cellulose; and (*b*) concentrated foods (grains, meals, cakes, etc.), containing a large amount of nutrient material in a small space. Roots and young grass appear to be bulky foods, but since their bulk consists of water, which in the ruminants is very necessary for digestion and which is easily absorbed from the alimentary tract, they are really watered concentrates. Animals with simple stomachs, such as the dog and pig, can only digest concentrated foods, and the same applies to the young calf. It is only the animals with complicated stomachs, such as the ruminants, or with a large cæcum and large intestine, like the horse, which can deal with large quantities of bulky foods containing much cellulose. Bulky foods occupy much space in the tract and take a long time to digest, for their nutrition is contained within the hard cellulose wall of the plant cell and it is not until this has been broken down by rumination, cellulose splitting bacteria and grinding in the omasum that the nutriment can be digested. By limiting the amount of bulk in the ration, therefore, more stomach accommodation is available for other substances and the rate of digestion and absorption is speeded up (Boutflour). In farm practice the concentrated foods are expensive and most have to be purchased, while those grown are mostly sold for human consumption; on the other hand, the bulky foods, such as hay and straw, can only be cashed through the animal, and as there is a surplus of these foods in the country the farmer tends to feed too much. The plant when it is young has thin cell walls and is very protoplasmic, *i.e.*, with high protein and salt and low cellulose content, but as it grows up it fixes more carbohydrates and builds them up into the cell walls, first as the more soluble celluloses and then the insoluble ones, such as lignin; during this stage it runs to stalk and further carbohydrate which is formed goes to the seed. In young grass, therefore, the animal has a highly digestible concentrated protein foodstuff which also contains much water, while in the old plant the animal has a bulky food of low digestibility which is relatively low in protein. The differences in the nutritive value of different plants are explained in general by their differences in cellulose and lignin content. Just as one species varies during the course of its life, so species vary between themselves at the same stage of growth. The chemical composition of young herbage of different species is much more nearly similar than is their composition when

they are old, so that feeding in the early stages of growth is the best method of using inferior grasses; moreover, they will supply what the milking cow requires, a high protein ration in small bulk. The increase in yield of milk when cows are first turned out to grass in the spring is evidence of this. The cellulose of young greenstuff, too, being of the more soluble variety, is much more digestible than that of hay. Two examples illustrating the differences in composition and digestibility of crops in different stages of growth may be given. The first was made by Kühn, with trefoil fed to cattle, and the second by Woodman, with pasture grass fed to sheep. In the first the stages of growth are all comparatively late, while in the second the extremes of growth differences are compared.

The slight differences that occur in the feeding values of straw from spring sown as compared with winter sown corn, and between the straw obtained from different districts, depend on the same principle—the degree of maturity of the plant.

Differences in the rate of digestion between concentrates and bulky feeds possibly explain the practice of feeding cows with concentrated foods during the day and giving them their bulky food mainly at the evening feed. The interval between feeds is shorter during the day and the concentrated food can be dealt with quickly, whereas the interval between feeds is long during the night and the slowly digesting hay is therefore given then.

Another factor which influences the rate of digestion is the "lightness" of the feed. Highly concentrated mixtures of meals with a high protein content may be made up and yet if fed alone will give unsatisfactory results for milk production. These so-called "heavy" meals are slow in being digested when fed in large quantities by themselves, for when they reach the stomachs they set in the form of a large doughy mass which is not easily penetrated by fluids and, not being digested, they give the animal indigestion and put her off her feed. Ground wheat cannot be fed in any quantity to cattle for this reason, although whole wheat boiled is digested better; beans, if fed in any quantity to sheep, are better kibbled than ground to a fine meal; maize, if fed in large quantities, is better flaked than as a meal. In these days of low corn prices experiments might well be made on flaking and puffing wheat and inferior barley in order to make them a suitable food for ruminants just as these grains are prepared as human breakfast foods in place of porridge. One of the reasons why crushed oats are such a valuable feed is that the husks "lighten" the mass when it reaches the stomach. The general make-up of lamb foods follows these principles. Where cows are being fed with large quantities of "heavy" meals for high production a "lightener" is with advantage added to the feed, the meals being mixed with sugar-beet pulp, bran and chaff before being fed. Such a mixture moistened with water before being fed should, after being squeezed in the hand, break to pieces and crumble easily and not set in a firm mass. Such is one of the physiological causes for the trouble taken in chaffing hay and straw, and the mixing and moistening of feeds before being fed. For high milk production and for the production of baby beef the chaffing should not be done to make the animals eat more of the bulky food, but in order that it shall perform the function of "lightening" the concentrates without appreciably adding to the bulk; where very high production is required sugar-beet pulp is often used for this purpose owing to the better quality of the fibre which it contains.

In feeding young calves and lambs for rapid growth the above-mentioned principle is of great importance at the stage where milk is being withdrawn and other foods substituted. When calves are on milk alone also the principle is evident and is probably the cause of the calf sucking a cow "doing" better than one which is pail fed. In sucking naturally, the calf takes it little and often, and when the milk reaches the abomasum it is curdled in small clots only, is quickly digested, and the calf is ready for more; but when large quantities of milk are gulped from the pail twice a day only, the milk is curdled in the stomach in one big clot which takes a long time to digest and gives rise to numerous digestive troubles and illnesses. If milk has to be given under these conditions, possibly diluting it with water, as fed to children, would assist in lightening the curd. In order to obtain the best results quite young calves should be fed 5—6 times daily.

A third factor influencing the rate of digestion is that the diet should be moderately laxative. For this reason also roots and young grass are valuable. Nothing hinders appetite so much as the slow passage of foodstuffs down the alimentary canal; if too fast, the nutriment contained in the food is not completely absorbed, but a moderately laxative state is the natural condition of the cow, and for high milk production the completeness of the digestion is of far less importance in farm practice than the rate of absorption. Time is of value to the cow as well as to man.

The value of succulence (roots, fresh grass, etc.) in the food is probably due partly to this effect on the working of the bowels and partly also perhaps to the fact that dry foods containing fibre take some time to absorb water, and until this happens they cannot be attacked by cellulose-splitting bacteria. In practice, this is frequently assisted by mixing succulents and chaff together and letting the lump stand for several hours before being fed, the time for the chaff to soak up water thus being saved within the animal. When roots are not available the chaff may be moistened with molasses and water. This practice saves the animal time in digestion, the mixing, the softening of the fibre, and the fermentation which goes on anticipating the changes which naturally occur in the rumen, while the chaffing saves a considerable amount of energy in the mastication of rumination. Since ruminants bolt their food, grains should be crushed before being fed, for they are with difficulty ruminated and so are not subject to the normal grinding processes of mastication, and often pass through undigested in the fæces; this is of more importance in cattle than in sheep. Where grains are given whole, pigs may be fed after cattle.

The Mechanism of Digestion.

In gathering food the movements of the tongue are of comparative importance in the ox; it is curled round the grass and withdrawn into the mouth, while the grass is cut off between the incisor teeth and the dental pad. By reason of the cleft upper lip the sheep and goat can bite

TABLE II.

Crop.	When cut.	Flowers of crop.	Composition—% in dry matter. Protein.	Fat.	Carbohydrate.	Cellulose.	Salts.	% Digested. Protein.	Fat.	Carbohydrate.	Cellulose.
(1) Trefoil	20 May	Quite green	19·6	2·5	42·5	25·3	10·1	70·8	57·9	70·2	50·6
	7 June ...	Beginning to show	16·3	2·9	44·9	28·1	7·8	64·9	64·4	68·3	46·6
	20 June	Withering	13·2	2·8	48·4	28·8	6·8	58·7	60·1	66·2	39·7
(2) Pasture Grass	Young, with lawn mower		26·4	5·3	44·4	13·5	10·4	81·0	50·1	81·5	78·5
	Old, as hay ...		9·9	3·6	49·0	30·0	7·5	59·0	40·0	63·7	59·1

more closely to the ground and can get a living where the ox could not do so.

The ruminants bolt their food; after a stroke or two of the teeth the food, moistened with saliva, is swallowed. The saliva, which acts as a lubricant, is derived at this time from the submaxillary glands which secrete actively only during the gathering of food, while the parotid glands are generally active and especially so during the process of rumination. There is little, if any, ptyalin or starch-splitting ferment in the saliva of the ox or sheep (Palmer, Ilgner), but it is produced in very large amounts by the ox, Colin estimating that about 112lbs. per day is produced. The amount secreted depends on the nature of the food; hay takes about four times its weight of saliva, oats a little more than their weight, while green fodder and roots require only about half their weight. The functions of the saliva in ruminants are mainly the supply of fluid to soften the food and facilitate the process of cellulose digestion by bacterial action, and by means of its alkalinity (sodium carbonate) to neutralise the volatile fatty acids produced as a result of this action (Scheunert).

The food when swallowed passes down the œsophagus and falls into the rumen and reticulum (Flourens). In spite of the size of the œsophagus, impaction is frequent in the ox; this is because it bolts its food without "mouthing" it first. In the rumen the food is churned, being thoroughly mixed by rhythmic peristaltic and antiperistaltic waves which go on continuously throughout life every 40—60 seconds. For this and other facts on the mechanism of rumination we are indebted to the recent investigations of Wester, who made observations on the living animal by means of a stomach fistula; with his hand or recording instruments inside the stomach, he was able to feel and record what was going on during this process. The rumen is divided into sacs by strong muscular bands (*Pilae ruminis*) which cross, and these act by constricting strongly while the peristaltic waves cause one sac to be dilated while the other contracts, so causing the contents of the rumen to become thoroughly mixed. Thus Steinhauf found that a few minutes after feeding oats a few grains may be observed distributed throughout the contents of the rumen. The spherical hair balls sometimes found in the rumen, weighing from a few ounces up to 6—7 lbs. are evidence of its rotating capacity.

The first three stomachs are of œsophageal origin and, like the œsophagus, have peristaltic and anti-peristaltic movements. There is hardly any sphincter at the base of the œsophagus, but when the contraction of the reticulum occurs it closes the lips of the œsophageal groove over the entrance to the œsophagus as a cap. The contents of the rumen and reticulum in health are always highly fluid (80 to 90 per cent. water) and especially so in the reticulum, in which, by virtue of its position at the base of the stomach, the more fluid parts tend to collect, as also do nails, stones or other foreign bodies so frequently swallowed by ruminants; owing to the location of the reticulum in the vicinity of the heart these bodies sometimes produce fatal results.

Many of the older authorities believed that water taken in small draughts travelled by the œsophageal groove to the third stomach, but Wester finds that water and saliva, independent of the size of the draughts, goes to the reticulum, and from thence it is driven by contractions to the rumen and other stomachs. The explanation of the origin of the large amount of fluid invariably found in the first two stomachs would otherwise be impossible, for they have no secretion of their own. The difficulty in dealing with fourth-stomach worm infection in sheep by drenches is well-known and is probably another illustration of this fact.

The mixing of water and saliva with the contents of the rumen is of great importance, not only for the process of rumination but also for the digestion of cellulose. The food swells and by maceration in the rumen at body temperature the optimum conditions for the action of enzymes contained in the foodstuffs such as grains occur: while both diastatic and some cellulose digestion probably occurs by this means (Brown), the latter is insignificant

as compared with the action of cellulose-splitting bacteria (Hopffe).

In cellulose digestion about 10 per cent. is lost as gas (6·9 per cent.) and heat (3·1 per cent.) (Markoff), the remainder being used by the animal in the form of fatty acids such as butyric, the sodium carbonate of the saliva being used to neutralise the contents of the rumen during this process.

The gases produced are mainly carbon dioxide and methane in the proportion of about 2·6 :1, the reaction being :—$2C_6H_{10}O_5 = 2C_4H_8O_2 + 3CO_2 + CH_4$ (Klein, Krogh and Schmit-Jensen). The fatty acids can be synthesized by the cow into milk fat and it was found by Sjollema that by feeding substances which ferment much, a lot of volatile fatty acids are produced in the rumen and the butter fat content in volatile fatty acids is increased : possibly this accounts for the soft butter obtained when cows are first turned out to grass. Woodman, arguing from the results obtained by Kelner, suggests that the digestible cellulose is broken down and absorbed as sugars, while Woodman and Stewart have found that bacteria can break down cellulose into sugars.

It is in this power to digest cellulose that the ruminant stomach differs greatly from those of other animals. As mentioned above, there are all grades of cellulose (formed by aggregations of the starch molecules) from the soluble type which is completely digested, and is of as much value to the animal as starch, to the highly insoluble type—lignin—which is only slightly, if at all, broken down in the animal and which forms a large proportion of the fæces while it adds considerably to the work of digestion. The amount digested varies according to the state of the plant's development and the type of cellulose, as is shown in the table given above. (Table II.)

The large quantities of gas formed are eliminated through the usual channels—the breath and rectum—but where fermentation is very rapid they are the cause of digestive troubles—tympany or "blown" in cattle and sheep. This mostly occurs where animals are freshly turned out on young green clover or grass, especially when wet (conditions which favour rapid fermentation) ; they eat to the capacity of the stomach and the gas formed overdistends the rumen and by force of pressure closes the natural means of escape. Feeding animals well with dry hay so that their stomachs are almost full before they are turned out should be a means of preventing this occurrence, dry hay or straw being slow in fermenting.

The food next goes through the process of rumination ; boluses are returned to the mouth, thoroughly masticated, and re-swallowed. The sheep usually begins to ruminate 15—30 minutes, while the ox begins 30—75 minutes, after a meal, and continues to do so for three-quarters to one hour ; at the end of this time the animal licks the muzzle with the tongue and then there is a fairly long pause, after which rumination begins again. There are usually 6—8 such ruminating periods in the 24 hours so that the animal ruminates for 5—7 hours a day and deals with about 90—130 lbs. of stomach contents in this way. The nature of the food has considerable influence in increasing or diminishing the necessity for the process of rumination. Dry food such as hay requires to be entirely subjected to a second mastication before it passes to the third and fourth stomachs, while the greater part of that which is moist and succulent passes readily to the third and fourth stomachs on its first descent ; this perhaps is the explanation of the fact that animals ruminate more in winter than in summer. It is said that rumination does not as a rule commence until after the animals have been watered, unless fed on green fodder or succulent foods and that even then they sometimes require water. It is also said that the longer the rumination is postponed the more difficult is its recommencement, since the food becomes dry and compactly packed in the rumen. The return of the bolus to the mouth can only take place if the rumen contains a fair amount of food and if the contents are rich in water. The rumen can never empty itself completely ; after starvation Colin found the rumen of the ox to contain 90—220 lbs. of contents.

The means by which the bolus (weighing 100 to 120 grms.) is raised to the mouth has been a matter of dispute. The external appearances are deep inspiration, closed glottis, contraction of the abdominal muscles and slight flank movements with the following expiration : the animal stretches out its head and neck, and with great speed a bolus ascends, to be seen as a dilatation running up the throat, after which one or two small dilatations go back again—the re-swallowing of the fluid portions which have lubricated the ascent of the bolus. The presence of this fluid is essential to the act of rumination, for rumination is impossible in animals deprived of water or in which the secretion of saliva is interfered with. Colin and Haubner suggested that the rhythmic contractions of the rumen and reticulum caused entry of the food into a vestibulum at the lower end of the œsophagus, but Wester in his stomach-fistula cow could find no evidence for a pre-formed vestibulum and the contractions of the reticulum tended to close the œsophageal groove rather than open it ; moreover, rumination proceeded when the contractions of the rumen had been stopped temporarily by atropine. Only about four seconds elapse from the deglutition of one bolus to the ascent of the next and of this period approximately 1½ seconds each is occupied by the descent of the bolus, the formation of a new one, and the ascent to the mouth. The fibres of the reticulum and rumen are largely smooth, and their contractions are slow and prolonged, while the rapidity of the act of regurgitation points to its being produced by striped muscle fibres such as occur in the œsophagus, diaphragm, etc. Flourens showed that the reticulum is not necessary, since rumination occurred in a sheep from which this organ had been eliminated. The theory that negative pressure in the thorax caused a sucking up of the contents of the stomach (Toussaint) has been shown by Foà not to be a complete explanation, for rumination may occur in cases of opened thorax. Wester finds that by contraction of its longitudinal muscle, the œsophagus is shortened and that this, together with an inspiratory state, forms a vacuum which becomes filled with the contents ; with a certain degree of filling the cardia closes and the bolus is passed to the mouth by anti-peristalsis. It was shown by Flourens that when the diaphragm is paralysed by cutting the phrenic nerve rumination may take place, but the abdominal muscles are called upon to make an extra effort. The œsophageal groove plays no part in forming the bolus ; Colin stitched

the pillars together and found that the process was not interfered with; moreover, the llama has only one pillar and yet ruminates.

Animals ruminate mostly with half-closed eyes (semi-slumber) and seldom when standing: as soon as the attention is attracted the animal abruptly ceases to ruminate and the bolus is held in the mouth for a time and mastication completed again before it is swallowed. This is why the farmer is unwilling to disturb his fattening bullocks when they are lying down. Animals on heat or separated from their young ruminate very irregularly and in young animals rumination is more irregular than in old ones, rumination does not occur at all during sleep or when the animal is in pain, ill-health or excited.

Although rumination can be stopped by an act of the will or is inhibited under mental stress, as many reflexes are, the commencement generally takes place involuntarily. The act is believed to be started by mechanical stimulus of the stomach contents, since the influence of the food given is marked; Steinhauf found that after a meal of coarse hay rumination started after a few minutes, while after a meal of mash it was hours before rumination was commenced, and similar results were obtained by Barboni. The pneumogastrics (vagus nerves) constitute the centripetal path of the reflex and rumination is suspended when they are divided; the automatic centre is in the medulla and the efferent nerves are the motor nerves of the œsophagus, diaphragm, etc. Aggazzotti found that failure to ruminate occurs after the administration of curare. Rumination appears to be a physiological development of vomiting (Meade-Smith) although apomorphine and tartar-emetic do not cause regurgitation in ruminants (Aggazzotti).

The bolus is masticated between the molars on one side only at a time, the upper jaw being wider than the lower. The time taken to masticate each bolus is usually about 35—65 seconds; 35—50 strokes of the teeth are usually taken in cattle, 60 in calves and 50—60 in sheep, the rate being accelerated towards the end of mastication of the cud. Young animals have a smaller number of teeth and therefore take a slighty longer time for mastication, as also occurs in old animals when the teeth are imperfect. Unilateral mastication may continue for as long as 15 minutes and then be reversed, usually as a new bolus enters the mouth. The parotids secrete actively during this mastication and the gland on the side masticating is 2—3 times more active than that of the other side; it has been estimated that the parotids of the ox secrete 900 grams of saliva every 15 minutes. By this action the material in the bolus is reduced to a finely comminuted condition and is mixed with much fluid.

When the bolus is re-swallowed it passes down the œsophagus to the reticulum and thence, if finely enough ground, to the omasum. The passage of the food to the third stomach (omasum) depends on two factors—the fineness of its division and its fluidity; some of the food may be in this state after the first deglutition and so does not require to be ruminated, while other portions may require rumination before they are in a fit state to proceed (Scheunert). The rate at which it proceeds also depends on the amount present (Steinhauf). As mentioned above, the more liquid parts of the contents collect in the reticulum; the entrance from the reticulum to the omasum is very narrow and is guarded by the folds of the œsophageal groove, which strain off large particles. Wester observed in the living animal that there is a sphincter within the neck of the omasum, but that no resistance is shown by the folds of the œsophageal groove at the entrance to the omasum. The opening and closing of the reticulum-omasum neck, according to Wester, occurs rather more frequently during rumination than at other times—three times a minute as against twice—the opening coinciding with the contraction of the reticulum.

The foregoing account of the passage of the food into the omasum is not, however, accepted by all authorities, although it has generally received support from most of the recent investigations. The view that the œsophageal groove is functional in the calf but not in the adult is also not yet universally accepted; for example, Professor Z. Moczarski, of Posen, Poland, suggests that the lips of the œsophageal groove are functional in the adult as well as in the calf and that the normal resting position of the lips is closed, so that food goes straight to the omasum as in the calf on milk. He suggests that bulky foods stimulate it to open so that they fall into the rumen and also that cold water or cold finely divided foods have the same effect; on the other hand, when warm water or warm finely divided foods are given the folds are not so stimulated and so these pass direct into the omasum. He states that when cold water is drunk quickly it can be heard gurgling as it falls into the rumen, whereas if it is warm no sound is heard as it passes into the omasum. The experimental evidence for this point of view is at present small, but in the calf, where the œsophageal groove is known to be functional, it is well-known that, when pail-fed, the milk should be fed warm and not cold; it may be that cold milk in this case opens the folds and enters the rumen, giving rise to digestive troubles. Whether or no the giving of warmed water to sick animals and the feeding of warmed slops to high-producing milk cows are in any way connected with this suggestion are points which have yet to be investigated.

When the food first passes to the omasum it collects in a small vestibule at its entrance (Wester); by contraction of the omasum this space is obliterated and the contents are driven between the leaves. As there is no sphincter muscle between the omasum and abomasum, contraction of the former drives the fluid parts immediately to the abomasum while the small particles are held up on the rough surfaces of the leaves. The contents of the omasum when the animal is killed are always finely divided and comparatively dry (50—60 per cent. water). The contents are ground still finer by pressure between the leaves and peristaltic contractions of the omasum wall drive them towards the abomasum, the action of the leaves in this respect being passive; Wester could feel no contractions of the leaves with his fingers. The papillæ have their free ends pointing towards the abomasum and so direct food particles towards it when the organ contracts; the anterior papillæ are shaped like an arrow while the posterior are like a file. The omasum has a separate nerve supply, stimulation of the pneumogastrics (vagus nerves) producing contraction in all the stomachs but this; after death the walls of the other stomachs relax, but this

contracts. In illness, when rumination ceases and the chief supply of fluid (saliva) is cut off, the contents of this stomach rapidly become dry and caked ; where obstruction of the stomach occurs it is nearly always to be found in this compartment. The whole omasum and especially the leaves are less developed in the sheep than in the ox (see Table I.) ; with the better grades of roughages and concentrates the difference in digestibility between cattle and sheep is not marked, but with the coarser and less digestible forages the difference is in favour of cattle (Armsby). Whether these differences are due to differences in the grinding power of the omasum, or to the greater percentage of water in the contents of the lower intestine in cattle favouring the action of organised ferments, is not known. According to Ewing and Smith, in steers there was with a higher moisture content of the fæces a more complete digestion of all constituents except protein and fat. Ewing and Wright in steers estimated the time taken for the food residues to pass through the different organs and the comminution of the particles which took place in each—which was as follows :—

TABLE III.

Organ.	Rumen and Reticulum.	Omasum.	Abomasum	Small Intestine.	Large Intestine.
Hours taken to pass through the organ ...	61	8	3	7	8
% comminution of ration ...	66	6 to 19	5 to 11	very little.	

The contents of the abomasum or fourth stomach are rich in water (80—90 per cent.) and are increasingly acid in reaction as the time from feeding increases.

The rest of the process of digestion in the ruminant is very similar to that of other species ; the amount of water absorbed from the large intestine, and so the consistency of the fæces, varies considerably in the different types of ruminants, the sheep and goat normally having dry fæces, while those of the ox are wet. The ox averages a large amount of fæcal matter passed in the day—about 75lbs.—while the sheep averages about 4lbs.

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(To be continued with report of discussion at meeting of the Scottish Metropolitan Division, N. V.M. A., at Edinburgh, on 21st November, 1928).

The Present Position of Vivisection, as it affects the Dog Owner, in England To-day.*

By FREDERICK HOBDAY, C.M.G., F.R.C.V.S.

The practice of " vivisection " in this country to-day is very strongly controlled by law, and I am going to read you a few extracts from a book, which any of you can get at the Stationery Office for 1s. 3d., entitled " Experiments on Living Animals." It is a pamphlet of some 66 pages which gives not only the official report on the subject for 1927, but a list of all who hold licences, all licensed places, and a full explanation of the clauses and conditions of the Act. It makes one see quite plainly that the words " vivisection " and " experiment " require considerable discretion and would be better transposed into others which do not sound so gruesome.

The actual word " vivisection " should only be used to describe some cutting operation without an anæsthetic—which is the sense the word conveys to the " man in the street."

The word " operation " might be used for experiments involving operations under anæsthetics as done on human beings every day in our hospitals.

The word " observation " might be used for every other procedure not involving a cutting operation.

If this nomenclature were adopted there would be no " vivisection " experiments to record in England to-day ; for no operation on animals—" operation " in the sense understood by the general pub ic—is permitted without full surgical anæsthesia.

Amongst the diseases to which the dog is subject, the most familiar is undoubtedly distemper. It is the most serious of all the canine scourges and I will take distemper as one of the diseases by which I propose to illustrate the present position of vivisection in this country to-day.

The efforts made to find a cure or preventative for distemper have been violently decried in the Press, and illustrated pamphlets have also been issued broadcast by certain Societies, whereas because the research workers held so-called vivisection licenses, it was owing to the stringency of our English cruelty to animals laws that even for a comparatively few injections it was necessary, in order to keep out of the clutches of the law, for those working at this disease to obtain official licenses so that they might put their results into concrete form and spread the good news broadcast for the prevention of the disease amongst other dogs.

To explain what I mean, I will give you extracts from the Cruelty of Animals Act of 1876, which was introduced

*An Address given before the Dog Owners' Club, March 21st, 1929.

into Parliament purposely " to control cutting experiments usually performed in Medical Schools and Physiological Laboratories "—and in those days there was so very little known about bacterial diseases that many thousands of so-called " experiments " (I refer to milk and drug tests) were not then thought of—and if the Act was re-written they would be classified merely as " observations."

The first clause in the Act says that the law is amended in order to extend its powers of control over the cases of animals which for medical, physiological, or other scientific purposes, are subjected when alive to experiments *calculated to inflict* pain—*i.e.*, in which pain may arise—and states definitely that " a person shall not perform on a living animal any experiment calculated to give pain, except subject to the restrictions imposed by this Act " ; and the experiment must be performed with a view to the advancement by new discovery of physiological knowledge, or of knowledge which will be useful for saving or prolonging life or alleviating suffering. The observer, or experimenter, must be a person holding a licence from one of the Principal Secretaries of State, the observations, or experiments, have to be made in a duly licensed or registered place—all of which are carefully inspected at unexpected hours. It is only under special circumstances that an animal upon which any surgical operation has been done is allowed to return to consciousness.

At a recent show, at which thousands of dog owners and dog lovers attended, I had a paper put into my hand upon which there were such astounding accusations ag. inst the humanity of Christian England that, as a member of the profession whose mission in life is to endeavour to alleviate the sufferings caused by disease amongst animals, I was struck with amazement, and I wondered if it could possibly be true. I also reflected that if it had this effect upon *my* mental outlook, its effect upon those who knew nothing about the grim, relentless way in which disease germs work, but who impulsively look only upon the sentimental side of things, must be akin to that of horror—and again I wondered if the figures in front of me were placed before the animal-loving public in a fair and square British fashion.

I read, for example, the bare fact that no less than 293,302 " *experiments* " were performed upon animals in the year 1927, and this number was 36,824 greater than in 1926.

The word " experiment " grated on my mind, as it led me to picture all kinds of dreadful things being done upon all kinds of friendly, helpless, animals, and this feeling was increased when I read that only 12,871 were stated to have been performed with anæsthetics. This left to the imagination the statement that some 280,431 so-called experiments had been done without any anæsthetic at all ; and I still pictured a very horrible state of affairs. So much did this impress itself on my mind that I wondered what our police could be doing to allow so much " cruelty " and what our legislators could have omitted when, at the instigation of the supporters of certain Animal Humane Societies, they passed the Cruelty to Animals Act in 1876. Especially did I think in this vein because I had been given to understand that this Act was especially introduced to control the cutting experiments usually performed in Medical Schools and Physiological Laboratories. In those days very little was done in regard to inoculation work either for the control or the transmission of disease. These 280,431 so-called " operations " were inoculations, or drug testing for standardising purposes ; and can anyone here suggest any other way of carrying out these necessary details ?

It is most difficult to obtain what is called a vivisection license, and it is only after the most careful scrutiny of one's credentials that the permission legitimately to use animals for any food tests even, is given. The application must be signed by one or more of nine Presidents of Bodies of such high integrity as the Royal Society, the Royal Irish Academy, the Royal College of Surgeons or the Royal College of Physicians, the Royal Medical Council, the Royal College of Veterinary Surgeons, etc., and, having obtained one or other of these, the applicant must also get the signatures of a Professor of one of the great branches of human medicine, before sending it to the Home Office for consideration. When the license is granted, the applicant is under the most rigorous rules in regard to inspection and to the restrictions against deviating from the actual work which the license covers. One must not forget, too, that in many instances the possession of several certificates does not necessarily mean more animals " vivisected." Often the more certificates one holds the more mild one's experiments. For example, in looking at the report, I read that no less than 278,041 so-called " experiments " were performed under Certificate A, and when I look up Certificate A, I am at first horrified to read that Certificate A " dispenses altogether with the obligation to use an anæsthetic," which again might convey a wrong impression, but what it really indicates is that those were inoculations or hypodermic injections or nutritional experiments, the majority of which were in regard to food, cod liver oil, milk, or such like observations on rats or guinea-pigs, or testings done to standardise drugs before allowing them to be put on the market for the use of man or veterinary patients. Even to work at anæsthetics themselves, and be able to publish the results, one had to have a license—in fact, two or more—and this is a further proof of the control given by our laws over this work.

The holding of a so-called vivisection license has been a necessary adjunct in the case of the observations, or so-called experiments, carried out in order to discover this valuable preventive serum against distemper, and I think that it is a very great argument in favour of the protection afforded to animals when, in the fight against disease, it is impossible to do even preliminary experimental work upon any living creature without obtaining official legal Parliamentary permission.

A still further proof of the stringency of our cruelty laws is the fact that during the process of endeavouring to find out a safe way of administering anæsthetics to the dog I had to hold the special license giving me permission to allow them to come back to consciousness again.

Even in the case of the dog, the question of observational work must be considered with sanity and in regard to " the greatest good for the greatest number." There are some who would never permit a dog to be used at all for any observational work which is intended to benefit man or even its own species, and there must surely be some inconsistency in this. One has only to take a disease such as distemper by way of illustration ; a disease which kills its thousands, generally after a lingering or painful death, every year. If the violent opponents to the use of a few dogs in an endeavour to cure or prevent a disease such as this, would only think for a moment of the benefit to the whole canine race which will follow the discovery of the means of prevention of this one disease alone, they would surely never need to be argued with.

Take again the great work which has been done for the prevention of rickets in children and in animals. By certain experimental work on feeding, the value of the necessity for a properly balanced diet has been so clearly demonstrated that even the man in the street knows (often even more clearly than his medical attendant) what is meant by the word " vitamin."

Anti-vivisection societies, if confining themselves to the words " vivisection " and " experiment," will always receive the whole-hearted support of the veterinary profession, provided they will confine themselves to the prevention of unnecessary or avoidable cruelty, but the word " vivisection," as it is used for propaganda purposes to-day, is a misnomer ; and indeed, the word " experiment" would be more truthfully expressed by the word " observation."

There would be a great deal of difference in the minds of the emotional public, if, in the publication of their propaganda work, some of the more rabid anti-cruelty societies truthfully dissected out the real " vivisection experiments " from those which could be put into the category of observational work, for it is not fair to inform an emotional public that so many " tens of thousands " of experiments were done under the Vivisection Act laws,

thus putting before their eyes a vivid picture of a dog being strapped down to a table and cut up with a knife in horrible fashion, forgetting to mention that by law the animal is bound to be properly chloroformed and that it is not allowed to come out of that chloroform back to life again; and also, that nine-tenths or more of these statistics were food or other non-painful observations or experiments performed on rats and guinea-pigs and rabbits.

Although societies for the protection of animals are excellent institutions, it is not good for them to be administered by cranks.

The veterinary surgeon, from the personal respect with which he is looked upon by his clientele, can do a great deal to influence true humanity to animals, and if we are dissatisfied with certain things, whether it be the ravages of disease or whether it be some method of killing animals for food, it is for us to do our best to strive to put the matter right. By our individual examples we can help the world forward by pioneering a practical teaching based on humanity without fads.

In conclusion, let me read to you what one of our most celebrated teachers recently wrote on this subject to the daily Press a few days ago :—

" The Very Rev. Dean Inge, D.D., the well-known Dean of St. Paul's Cathedral, in a recent article to the *Evening Standard*, wrote (under a paragraph headed " Vivisection and Hysteria "), " As for vivisection, I believe it is necessary for medical research, and not necessarily very cruel. But I am far from thinking vigilant control unnecessary."

This, I think, expresses the views of many people, and, although everybody deprecates the necessity, it is up to those who desire to help the cause of humanity most to devise some plan whereby *all* observations made on living animals will be avoidable.

Research Bureaux.

PROGRESS OF IMPERIAL SCHEME.

" Considerable progress has been made," says *The Times*, " in bringing into effect the scheme submitted last December to the Governments of the Empire to establish eight bureaux for the collection and interchange of information in eight branches of agricultural science. It was then announced that, as a result of a representative conference held in London, detailed proposals had been made for attaching these bureaux to recognised research institutes and for financing them from a common fund formed by contributions from Governments of the Empire and controlled by an Executive Council representative of the Governments.

The Governing Bodies of the Institutes which were approached have all accepted the scheme. The proposals have received the wide approval of the Governments of the Empire. The Executive Council at a meeting held at the end of March were thus able to authorise the opening of three bureaux from April 1, of a fourth from May 1, and to contemplate the opening of the remaining four during the summer months.

Those already opened are the Bureau of Animal Nutrition (attached to the Rowett Research Institute at Aberdeen), the Bureau of Animal Genetics (at the Animal Breeding Research Institute, Edinburgh University), and the Bureau of Fruit Production and Storage (at the East Malling Research Station, Kent). These three bureaux are respectively under the direction of Dr. J. B. Orr, Professor F. E. Crew and Mr. R. G. Hatton. From May 1 the Bureau of Soil Science at Rothamsted (under the direction of Dr. Sir John Russell) will be open.

It is contemplated opening during the summer the Bureau of Animal Health (at the Veterinary Research Laboratory, Weybridge), the Bureau of Plant Genetics (other than herbage plants) at the Plant Breeding Institute, Cambridge University, the Bureau of Plant Genetics (herbage plants) at the Welsh Plant Breeding Institute, Aberystwyth, and the Bureau of Agricultural Parasitology at the Institute of Agricultural Parasitology, St. Albans. These bureaux will be respectively under the direction of Dr. W. H. Andrews, Sir Rowland Biffen, Professor F. E. Stapledon, and Dr. W. Leiper.

The Veterinary Record.

27th April, 1929.

ANIMAL EXPERIMENTATION.

The rapid development of medical and veterinary science in modern times has been greatly facilitated by experiments which have necessitated the use of living animals. Without this method of investigation certain diseases which have been completely eradicated, and many which have been reduced to comparatively small proportions, would have continued their ravages unchecked. From the classical studies of Jenner on vaccination, and Pasteur and his pupils on anthrax, rabies, etc., down to the most recent discoveries on preventive measures against yellow fever and distemper, there is an overwhelming mass of evidence in favour of animal experiments.

Nevertheless, for many years, certain societies have maintained an intensive propaganda against vivisection in any shape or form. The widely inaccurate statements which are disseminated in their various publications are calculated to mislead those sections of the public who are unacquainted with the true facts. We feel that, although most laymen are sensible of the benefits which have accrued to mankind through the efforts of scientific workers, and are fully cognisant of the necessity for experiments on living animals, there is a minority whose judgment is perverted by the specious arguments of those who seek to abolish such experiments. There is always the danger that sentimental pity for the supposed sufferings of these animals will stultify the efforts of those who are engaged in combating the great scourges of man and the lower animals.

It is well to remember that the whole question was considered by a Royal Commission on Vivisection, which sat from 1906 until 1912. The evidence of a large number of witnesses was taken, and the subject was examined from every aspect. It is not without interest to recall the conclusions of this Commission.

(1) " That certain results claimed from time to time to have been proved by experiments upon living animals, and alleged to have been beneficial in preventing or curing disease have, on further investigation and experience, been found to be fallacious or useless.

(2) That, notwithstanding such failures, valuable knowledge has been acquired, and that useful methods for the prevention, cure and treatment of certain diseases have resulted from experimental investigations upon living animals.

(3) That, as far as we can judge, it is highly improbable that, without experiments made on animals, mankind would, at the present time, have been in possession of such knowledge.

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(4) That, in so far as disease has been successfully prevented or its mortality reduced, suffering has been diminished in man and the lower animals.

(5) That there is ground for believing that similar methods of investigation, if pursued in the future, will be attended with similar results."

The holders of licences under the Cruelty to Animals Act of 1876 are compelled to comply with very exacting requirements, and the laboratories at which animal experiments are undertaken are subject to a rigorous inspection at any time without previous notice.

Undoubtedly, the stringent precautions which are taken to prevent improper or unnecessarily cruel experiments on living animals are fully justified, and they have always received the wholehearted support of the veterinary profession. The public can rest assured that, whilst these regulations do not unduly interfere with the progress of scientific knowledge, they provide an adequate safeguard to all animals which are under experiment.

R.A.V.C. Golfing Society: 1929 Meeting.

The Annual Meeting of the Society will be held, by the kind permission of the North Hants. Golf Club, at Fleet, on the 22nd and 23rd of May, 1929.

PROGRAMME OF EVENTS.

1ST DAY.	*Morning.*	(*a*) Eighteen holes singles (medal play) Scratch for R.A.V.C. Challenge Cup. (*b*) Eighteen holes singles (medal play) under handicap for R.A.V.C. Founder's Cup. These two events will be carried out concurrently.
,,	*Afternoon.*	Eighteen holes (medal play) foursome under handicap.
2ND DAY.	*Morning.*	Eighteen holes singles play under Handicap V Bogey for a cup presented by the Captain of the Society. (Major G. T. T. Jackson). Entrance fee, 2s. 6d.
,,	*Afternoon.*	Eighteen holes foursome play under Handicap V Bogey. Entrance fee, 2s. 6d.

There will be optional sweepstakes of 2s. 6d. on each handicap event.

NOTES.

1. The R.A.V.C. Championship and Founder's Cup. No competitor may take more than one of these prizes.
2. Competitors may choose their own partners, and should inform the Hon. Secretary of the names of their partners when entering. In the event of their inability to do so the Hon. Secretary will arrange. Competitors must declare their lowest club handicap before commencement of play.
3. Competitors should be ready to start at 10 a.m. Order of starting will be arranged by the Hon. Secretary.
4. Members are requested to notify the Hon. Secretary of the Society—c/o Station Veterinary Hospital, Aldershot, Hants., as early as possible:—
   (*a*) Whether it is their intention to be present at the meeting—to enable the necessary arrangements *re* meals, etc., to be made.
   (*b*) Whether they want caddies.
5. *Accommodation.*—Station Hotel, Fleet. Golf Club House (very limited). Those desiring accommodation at the Club House should inform the Hon. Secretary as soon as possible.

CLINICAL AND CASE REPORTS.

Unexpected Post-mortem Findings.

By R. W. LEWIS, M.R.C.V.S., Campbeltown.

A call was recently received to attend a 14-year-old Clydesdale mare due to foal in three weeks' time. For a week prior to this she had been idle and allowed out in a paddock each day. On the day of my visit the mare was brought in at mid-day, as the weather was inclement, put in her box and fed and, according to the owner's statement, was normal in every way. About an hour later he found her lying down apparently in pain and struggling to rise, which she was unable to do, and he immediately sent for me. She was in a small loose-box, well bedded with straw, and lying on her offside, in great agony. She was unable to rise, though able to sit on her haunches, which she was doing at short intervals. Further examination showed a rapid, running-down pulse (120 per minute) and temperature 103° F. Respirations were laboured and rapid. Conjunctival membranes were slightly injected, though those of the oral and nasal cavities were paler than normal. There was a slight sanguinary discharge from the vulva and she kept looking round anxiously to her flank.

Efforts to raise her were unavailing and, in view of the pain, a strong anodyne was administered, and a waiting attitude was adopted till more definite symptoms enabled a diagnosis to be made. She was made as comfortable as possible and was seen later in the day. Conditions had altered for the worse and this time all the mucous membranes were pallid, the pulse had gone up to 170, temperature was barely normal, patchy sweating had broken out and rigors were present. There had been violent struggling. The owner had turned the mare on to her near side during my absence.

A diagnosis of internal hæmorrhage was given and as she was evidently *in extremis* the question of slaughter was considered. She died less than an hour later.

A *post-mortem* was made the same day and the diagnosis of internal hæmorrhage was confirmed. The abdominal cavity was full of blood and further search revealed a ruptured uterine vein in the broad ligament. Whilst the knackerman was removing the hide it was observed that there was some extravasation of blood around a hock joint and on closer examination the following condition was found. The flexor perforatus tendon (superficial digital flexor) was displaced laterally, the capsule being torn from the tuber calcis. The end of the gastrocnemius tendon was also torn from its attachment and was lying about three inches away from the tuber, leaving a rough surface on that bone, the torn end of the tendon having a gritty feel. The other hock was found similarly injured.

This unexpected *post-mortem* finding raises the question as to which was the primary condition, the injured vein or the ruptured tendons; also, how did the injury to the tendons arise? As the mare was fat and heavy herself and carried a very large foal, was it possible that, whilst she was attempting to rise, the tendons had given way, or, otherwise, did the injury occur whilst struggling subsequent to the rupture of the uterine vein? On the one hand,

did the vein rupture first and the mare, in trying to rise, fall down through loss of co-ordination, her legs being doubled up under her thus putting the joint in extreme flexion ; or, on the other hand, did the mare in jumping up rupture these tendons owing to her own weight combined with that of the extra heavy fœtus and in her subsequent abortive attempts to rise cause injury to the vein ? It should be observed here that, although no exhaustive examination of joints was made, the ordinary tests for sensation were carried out and the legs freely handled, in attempts to place her in a position of ease, and nothing unusual was observed. Granting that the examination of the joints was perfunctory, the absence of any glaring abnormality on the occasion of the first visit leads me to suppose that the ruptured vein was the original injury.

Umbilical Hernia.

By HERBERT BUCKINGHAM, M.R.C.V.S., Norwich.

My experiences of the use of sulphuric acid as a remedy for the removal of umbilical hernia in foals may be of some interest.

For a number of years I managed the large practice of the late Mr. Fred Simkin, and I was once instructed by him to go to a given place and apply strong sulphuric acid, with a feather, to a foal affected with umbilical hernia. In answer to my somewhat surprised enquiry, he repeated his instructions and added that strong nitric acid would do just as well. I did as I was told and the case was quite a success.

In the course of two or three years I carried out this treatment upon about 25 cases. Amongst them was a thoroughbred foal. The first application did not prove quite a success, so after two or three weeks I repeated the treatment and it cured the trouble.

In the year 1902 I applied sulphuric acid to two cases ; each was a foal out of a light cart mare and in each case the bowels escaped from the abdomen. Why this should have happened in these two cases I do not know, and I often wonder how I should have fared if the thoroughbred foal had proved to have been a fatal case.

Needless to say, I immediately discarded the application of sulphuric acid to an umbilical hernia and reverted to the double-screwed iron clam, which is a safe and sure remedy, but is more trouble because of the necessity of a second visit to tighten the screws.

Castration of Horses by Ligature.

By H. BUCKINGHAM, M.R.C.V.S., Norwich.

In the year 1910 I started practice in Norwich, purchasing a set of instruments entirely new. Amongst these was a "Buckingham's" écraseur, from Arnold's (it is now deleted from their successor's list), with one chain—the only écraseur they had. A few weeks after I was asked to castrate a two-year-old colt.

I started on my journey with écraseur, searing irons, etc.

I cast and bound the animal and cut through the skin and peritoneum, letting out one testicle. I placed the chain round the cord and proceeded to tighten it. When the chain became taut it snapped.

We were in the middle of a wood and had no fire with which to heat the irons. What was to be done ?

Very quickly I opened my bag, carefully and cooly put the instrument into it, and produced some very strong cord. I cut a piece off and with it I ligatured the cord of the testicle, leaving long strands protruding, and removed the testicle with my knife. I then operated on the other testicle in the same way. I left the pieces of cord long, so that they should be sure to come out of the wound when the ends of the cords of the testicles sloughed, and should not become encased when the skin healed.

I have helped to castrate a large number of horses and treated them after that operation, but I never saw one do better. Soon after that, I was injured in a motor accident and Dr. Hatch treated me. I discussed the case with him and he told me that he was once stationed in India, where at that time most of the horses were castrated by ligature.

I am wondering what are the objections to this method of performing the operation.

The National Horse Association.

ANNUAL GENERAL MEETING.

Sir Walter Gilbey, presiding at the Annual General Meeting of the National Horse Association of Great Britain on April 10th, stated that the membership of the Association now stood at 77 societies and 306 private members and firms. The Council report, which had been circularised to all members, indicated that on a small income, much work of a thoroughly sound and useful character had been undertaken.

The recommendations of the Slippery Roads Committee, proceeded the President, had created considerable attention, and the continued activities of this Committee were having beneficial results in many parts of the country. Some further carefully considered suggestions and recommendations would be available in due course.

The campaign to encourage the use of the horse for transport was proving highly successful. Many firms were consulting the Association, and the pamphlet giving detailed comparative costs was being largely circularised. Sir Walter further remarked that the special thanks of the Association were due to the Press throughout the country, who had kindly given so much publicity to the various articles, leaflets, and circulars issued during the year.

Mr. Nigel Colman, M.P., in seconding the motion for the adoption of the report, stated that he was gratified to see the support extended by agricultural societies, and trusted that many more would enrol during 1929. The work undertaken was invaluable and all interested in the horse should feel gratified that the Association was now firmly established on a sound footing. The report was adopted.

Mr. Cecil G. Argles (so actively connected with the Slippery Roads Campaign) was then elected President for the ensuing year, while Lieut.-Col. Sir Archibald Weigall, K.C.M.G., was nominated as President-elect (President in 1930).

Captain Hon. George Saville proposed a cordial vote of thanks to the retiring President, and desired to express, on behalf of members, their sincere thanks to Sir Walter Gilbey for his whole-hearted interest and work. He was to be congratulated on inaugurating and so firmly establishing an Association doing so much good for the general welfare of the horse.

REVIEWS.

[Helminthology: Medical and Veterinary, H. A. Baylis, M.A., D.Sc., British Museum (Nat. Hist.), Royal 8vo, pp. xii + 304, with 200 illustrations. Price 30/-. Postage: inland, 9d., abroad, 1/-. Ballière, Tindall and Cox, London.]

Within the last twenty years many changes have taken place in parasitology. New forms have been described, old forms re-described. Important life-histories have been worked out and our knowledge of the bionomics of parasites and of the harm which they do to their hosts has been clarified. New drugs have been introduced—some successfully, others less so—and, most confusing of all to those who worked at the subject in pre-war days, there has been a revolution in nomenclature. Forms which used to be regarded as single species have been broken up into different genera. Different names have been united to name a single species. Old and forgotten names have been excavated and brought into every day use. This is particularly true of that part of parasitology which dealt with the parasitic worms. Obviously, unless one knows the parasite with which one is dealing, information as to bionomics, control measures, pathology and therapeutics is largely useless. Accordingly, there has arisen a real need for a text-book, of reasonable dimensions, which would supply the information necessary to diagnose any form which the veterinary surgeon would be likely to encounter. This need has now been supplied by Dr. Baylis in his new Manual of Helminthology.

The volume is essentially a zoological one and deals with the subject systematically—not by hosts. The flatworms and the roundworms are considered in general terms and then, family by family, all the forms which occur in man and the domestic mammals and birds are described shortly, clearly, and concisely. Many of the parasites are illustrated in line drawings—there are two hundred of these—and where there is a number of closely related forms, the more important diagnostic features are tabulated. Where possible, the salient features of the life history are indicated, although there are still many gaps in our knowledge of this part of the subject. At the end of the volume are exhaustive host indices for all the important animal groups with which the veterinarian is concerned (man, dog, cat, pig, cattle—including ox, zebu, and buffalo—sheep, goat, equines—including horse, donkey, and mule—fowl, turkey, guinea-fowl, duck, goose, and pigeon), together with a comprehensive general index.

The book is clearly and accurately written and will certainly fill adequately one of the lacunæ in the literature of the subject. A reliable treatise on helminthology, from the zoological point of view, has long been wanted and we are sure that this volume will be welcomed by all who are interested in this most important branch of the subject. T.W.M.C.

The exposure of meat to the dust and pollution of a city atmosphere, too frequent handling by dirty hands and to the attacks of an army of flies, to say nothing of people breathing and coughing over it, was an insult to our health intelligence. Here was a great work for public health authorities in forbidding its unprotected exposure to the public gaze and in insisting upon meat being kept in the background and in glass cases.—*Sir William Milligan.*

[Iodine in Nutrition. A Review of Existing Information. J. B. Orr and I. Leitch. Medical Research Council, Special Report Series, No. 123, H.M. Stationery Office, 2s. 6d. net.]

This special report (No. 123) of the Medical Research Council is suitably described by its sub-title as "a review of existing information." The claim is fully justified in the text, as, apart from its therapeutic uses, iodine, both organic and inorganic, is described from every aspect that might in any way be associated with questions of nutrition. Thus, after a preliminary historical survey, a chapter is devoted to the distribution of iodine in the different types of rock and soil, in plants and in animal tissues. In view of the frequent reference by popular writers to the different iodine content of various foodstuffs, it is interesting to note that the variations in this value for plants of the same species are quite considerable and that they tend to overshadow the differences between plants of different species; in fact, the iodine content of both plant and animal tissues varies considerably with the iodine intake. This inconstancy of this value is well illustrated by the excellent tables given in the appendices. Experimental results abound in the book, but it is at times rather difficult for the reader to assess the value of the masses of conflicting results, although admittedly the authors frequently indicate this themselves. For instance, in the chapter on iodine in plant metabolism the experimental results recorded are not altogether in agreement, yet it is suggested that in certain cases a marked stimulation of plant growth is induced by iodine treatment and that, in fact, iodine has a marked effect on physiological processes in the plant. The activity of nitrifying bacteria is increased and the assimilation of nitrogen promoted.

It is doubtful whether inorganic iodine accelerates growth in animals, although the feeding of thyroid certainly does in cows, pigs, rats. etc, The regulation of the basal metabolic rate is one of the main functions of the thyroid. In the absence of thyroid secretion, either in thyroidectomised animals or in myxœdema, the basal metabolic rate is sub-normal. The administration of thyroid secretion raises the rate both in normal subjects and in cases where there is lack of thyroid secretion. The administration of iodine, on the other hand, at least in rats and in exophthalmic patients, lowers the basal metabolic rate. The rise in basal metabolic rate which follows the feeding of thyroid appears to be wholly or chiefly due to increased carbohydrate metabolism. Iodine stimulates intestinal movements and excessive doses cause diarrhœa. Thyroid appears to have a somewhat similar effect. The iodine content of the blood varies directly with the administration of either organic or inorganic iodine; it falls after thyroidectomy. While the thyroid appears to be necessary for the normal growth and functioning of the sex organs, excess of thyroid interferes with sexual development. Moderate increases in iodine supply may stimulate activity, but large doses may be toxic. The whole subject of goitre in both man and animals is very fully summarised. No mention is made of bull dog calves.

Altogether, the book is a most excellent review and abounds with both experimental results and references which add considerably to its value. W. R. W.

National Veterinary Medical Association of Great Britain and Ireland.

Quarterly Meeting of Council.

The second quarterly meeting of Council, N.V.M.A. for the year 1929 was held at 10 Red Lion Square, W.C., on Tuesday, April 9th, with the President, Dr. O. Charnock Bradley, in the Chair.

The following members of Council were also present:—Mr. H. Bell, Mr. J. C. Coleman, Mr. H. J. Dawes (Hon. Secretary), Major G. W. Dunkin, Mr. R. E. Glover, Mr. F. L. Gooch, Principal F. T. G. Hobday, Major T. M. Inglis, Major H. Kirk, Mr. J. W. McIntosh, Major-General Sir John Moore, Captain S. J. Motton, Mr. R. B. Nelder, Mr. C. E. Perry, Major D. S. Rabagliati, Lieut.-Colonel J. W. Rainey, Captain J. R. Rider, Mr. H. L. Roberts, Professor J. Share-Jones, Lieut.-Colonel P. J. Simpson, Captain R. Simpson, Mr. H. P. Standley, Captain W. K. Townson, Mr. J. B. Tutt, Mr. E. Alfred West (Hon. Treasurer), Professor A. W. Whitehouse, Professor G. H. Wooldridge and Captain W. G. Wragg, together with Mr. J. C. Neve (Solicitor, who deputised for Mr. C. O.Langley), and Mr. F. Knight, Secretary.

The minutes of the January meeting of Council, which had received publication in the *Record*, were taken as read and were confirmed.

Arising out of them, the Council, resolving itself into Committee for the purpose, received the report of the Sub-Committee, appointed at the previous meeting, "to decide on the terms of a letter to be sent to the Governors of the Royal Veterinary College, Camden Town, N.W., urging that a sympathetic view be taken of and consideration be given to the present position of Professor James Macqueen—a copy of the letter ultimately decided upon to be sent to the Departmental Committee on the Reconstruction of the Royal Veterinary College for their information."

Upon the resumption of open meeting it was resolved, on the proposition of Mr. McIntosh, seconded by Professor Share-Jones, to await the report of the Departmental Committee before taking further action, but to request that committee to furnish the Association at an early date, if they will, with their observations on the question at issue.

Also arising out of the minutes, letters were read from Major G. W. Dunkin and from Dr. P. P. Laidlaw, of the National Institute for Medical Research Farm Laboratories, Mill Hill, expressing their deep appreciation of the Council's expression of opinion regarding their work on dog distemper.

Correspondence.

(1) Apologies for inability to attend the meeting from Mr. H. R. Allen, Mr. W. H. Brooke, Mr. J. H. Carter, Major Brennan De Vine, Mr. A. Gofton, Captain O. V. Gunning, Mr. P. J. Howard, Mr. R. Hughes, Captain N. H. McAlister, Captain J. McAllan, Mr. G. P. Male, Major H. Peele, Captain A. W. Noel Pillers, Captain G. W. Weir, and Lieut.-Colonel T. Dunlop Young.

(2) From the Secretary of the Royal Sanitary Institute, inviting the Association to send a delegate or delegates to the 40th Congress and Exhibition of the Institute, to be held at Sheffield from July 13th to 20th, 1929.

The President was appointed as the Association's delegate, with power to send a substitute.

(3) From Major G. W. Dunkin, in the following terms:—

National Institute
for Medical Research,
Farm Laboratories,
Mill Hill, N.W.7.
February 25th, 1929.

Dear Mr. Knight,

I desire to draw the attention of the Council, N.V.M.A. to what I consider to be a series of grave and, if I may say, unfortunate omissions on the part of the Royal Sanitary Institute in the composition of their Council to be elected this year, their Vice-Presidents and the gentlemen who are down to support the Duke of Northumberland at the forthcoming dinner to be held on March 21st next.

In the latter list I observe the Presidents of the Royal College of Physicians, of the British Medical Association, The Director of the Army Medical Service, and the Medical Director-General of the Navy. Our two Presidents seem to have been left out and, in my opinion, the omission is only too apparent.

In the list of Nominees for the position of Vice-Presidents, numbering thirteen, I observe the names of six medical men but no veterinary surgeon.

The Nominees for Council comprise the names of eight gentlemen, four of whom are medical men and one a veterinary surgeon (Mr. Hayhurst).

I should hate to think that this is studied and intentional, but at the same time, in view of the fact that a large number of our men take the Royal Sanitary Institute Examination every year, that the Institute contains many members of our profession as Members and Fellows, that there is a section devoted to Veterinary Science at every Congress, and that members of our profession have been appointed examiners to the Institute, I consider that this omission is, to say the least, most unfortunate. I am a member of this Institute, but unless there is some alteration in the composition of the governing body I shall resign, as I hope others will.

Doubtless the President would like to see my letter before it is brought up before Council.

I enclose the Balloting List.

Yours sincerely,
G. W. Dunkin.

Mr. F. Knight,
Secretary, N.V.M.A.,
10 Gray's Inn Square,
W.C.1.

The President: This is not an absolutely new point, gentlemen, because it has been raised at a Council meeting before, and Professor Wooldridge on one occasion, I remember, promised to see what he could do to get representation on the Council of the Royal Sanitary Institute.

Major Dunkin: Professor Wooldridge went into the matter very thoroughly and ascertained for this Council the information that the Articles of Association of the Royal Sanitary Institute did not permit them to elect veterinary surgeons, as representing a particular body, on their Council, but the fact that their rules and regulations are archaic is not our business. I have definitely resigned from the Royal Sanitary Institute for the reasons stated in my letter. I should like to hear the President of the Royal College on this subject.

Professor Share-Jones: I received an invitation, as President of the Royal College, to the Dinner of the Royal Sanitary Institute, but unfortunately I could not go, and my communication to their Secretary seems to have gone astray. However, I received no information at all concerning it until I received a letter from Major Dunkin, when I got into communication with him and the Secretary. That disposes of the dinner. I also received an

invitation to become a Vice-President of the Congress, which is a different thing altogether from a position on the Council of the Governing Body of the Institute. I agree with Major Dunkin that it would be right for us to secure representation—and very strong representation—for our profession on that Council, and particularly now, when we are engaged in matters which might bring us into very serious discussion with them. But I do not quite agree with Major Dunkin as to the way in which we might secure this. I think the way to secure power is to remain inside. I wrote to Major Dunkin suggesting that he might not resign, but that we should first make representations to them on the lines of the points he has made—that their constitution was drafted at a time when our profession was not what it is to-day and when we did not have such claims for representation as we now possess, but that now the time has arrived when they might reconsider the matter in the light of the present position of the veterinary profession.

Mr. GOOCH: I should like to ask the President of the College if that Vice-Presidency is simply the Vice-Presidency of Section E—Veterinary Hygiene.

Professor SHARE-JONES: I think that is what it would be, Sir.

The PRESIDENT: Will someone move a definite line of action? Shall we communicate with the Royal Sanitary Institute?

Mr. COLEMAN: I would like to propose that a small committee be elected, composed of Major Dunkin, the President of the Royal College, Professor Wooldridge and yourself, to consider a line of action, with power to proceed.

Professor WOOLDRIDGE: I think a representation would be welcomed. I cannot give that view definitely—as one officially accepted by the Council of the Institute—but I think that expresses the definite opinion of a majority of the leading men of the Council, whom I know.

Dr. SHARE-JONES: Our first step would be to examine the constitution of their Council. We intend going as far as will be necessary to give our profession a real function on the constitution of that body.

The PRESIDENT: At any rate, you will set up this Committee, with discretionary powers?

The Council expressed unanimous assent.

(4) From Mr. Bernard Gorton, of Bournemouth,' in the course of which he stated:—

"I hope that your Council has not lost sight of the necessity, for the welfare of the Association, of making a member's subscription include the subscription to his Division, as in the case of the Pharmaceutical Society and the B.M.A. I really cannot understand why this has not been done, for, according to the year's report, there is ample money available. It need not destroy the individuality of Divisions as local societies, for these could still have local members who pay direct to the local society for privileges not connected with the N.V.M.A.

"Article 17 of the B.M.A. reads: 'Every member whose address as registered for the time being in the books of the Association is at a place situate within the area of any Division shall, *ipso facto*, be an ordinary member of that Division and no other.'

"By-law 9 reads: 'Any Division or Branch may elect as a complimentary member any qualified medical practitioner or person distinguished in science resident within the area of the Division or Branch, but not eligible for ordinary membership of the Association. Divisions may by their local rules confer on extraordinary members such privileges other than that of voting, etc., etc.'

"In my opinion, such regulations as these would not deprive any body of their present privileges, but would bring about an increase in the membership of the N.V.M.A."

The HON. SECRETARY: I do not see that we can do anything in this matter. The subscription to the local society is so small that it is hardly worth talking about.

The PRESIDENT: It is true that in the British Medical Association one does not pay any subscription to Divisions—the expenses come out of the Association. But we are not constituted quite in the same way as the B.M.A. and we have been extraordinarily careful not to encroach, in any respect, on the domestic affairs of the Divisions. Whether or no the time is ripe for making a change, I am not prepared to say.

The SOLICITOR: Article 29 deals with the question of subscriptions. It merely says: "Members entering the Association shall pay to the General Treasurer an annual subscription of two pounds two shillings (or such sum as may be decided at a General Meeting from time to time)." It says nothing about subscriptions to the Divisions.

The PRESIDENT: It must be remembered that a member of the B.M.A. may only belong to that Division of his Association within the area of which he ordinarily resides.

Colonel SIMPSON: That would act very adversely to some of our Divisions, Sir. (Laughter.)

The HON. SECRETARY: I propose that we take no action.

Mr. COLEMAN seconded the proposition, which was carried unanimously.

The SECRETARY reported that twenty replies remained to be received from Divisions in response to the Council's request to them to furnish their views in reference to the proposed addition to Article 59 in the Articles of Association of the Association.

Pending the receipt of completed returns, consideration of this matter was deferred.

Resignations from Membership.—The SECRETARY read a communication from Mr. John Dunstan, of Liskeard, Cornwall, stating that, having had to retire from business in consequence of ill-health, he proposed to resign his membership of the Association. A further intimation of intention to resign—that from Mr. S. Littler, Senr., of Newark, was also placed before the Council.

The PRESIDENT: We are very sorry that Mr. Dunstan should cut himself asunder, as it were, from the profession, but I think we shall have to accept, with regret, both these resignations.

Elections to Membership.—The following gentlemen, having completed forms of nomination and paid their subscriptions, were unanimously elected as members of the Association: Messrs. A. M. Alba (Peru); W. P. Blount (Edinburgh); E. A. Burgon (Edinburgh); S. Codrington (Chipping Sodbury), A. A. Comerford (Potton), John A. Craft (Cranleigh); J. T. R. Evans (West Ham); D. G. Grealy (Swinford); W. S. Gray (Durham); F. C. Heathcote (Totteridge); N. H. Hole (Weybridge); N. Irvin (North Shields); P. A. McCorry (Ballyconnell); J. M. McDonald (Beith); W. F. Morton (Alderley Edge); R. B. H. Murray (Lincoln, New Zealand); Lieut. A. G. Ralston (R.A.V.C.); W. Rhodes (Wimbledon), and M. Sarwar (Gujrat, Punjab).

Reports of Committees.

Editorial Committee. In the absence of the Chairman of this Committee (Sir John Moore), the following report of its work during the past quarter was read by Mr. J. Willett, who moved its reception and adoption :—

The meetings of the Committee during the past quarter have been very well attended.

The amount of material received for consideration has been well above the average in both quality and quantity, and the publication of that selected has necessitated the enlargement of four consecutive issues and of sundry other numbers of the *Record*. A contributing cause for this enlargement has been, and is likely to remain, the ability to produce weekly twelve pages of advertisement matter as a standard. Previously, the standard number of advertisement pages has been ten.

Reverting to the literary pages, a good deal of prominence has been given to the publication of contributions relative to the Report of the Lovat Committee on the Colonial Veterinary Service, this report having been dealt with editorially on several occasions. Copies of the *Record* containing these articles have been placed in the hands of members of that Committee.

A new feature of great interest has been the publication from the *Veterinarian* of 100 years ago of selected abstracts forwarded by Professor Buxton, who was responsible for putting forward the suggestion as to their publication, which the Committee was delighted to adopt.

Another item which it is hoped to establish permanently is the presentation in the columns of the *Record* of reports by well-informed members of the profession, at the request of the Committee, of agricultural, horse and dog shows of importance.

The Committee was glad to accede to the request of the Librarian of the Royal College of Veterinary Surgeons to assist the Library in securing, through the medium of exchange with the *Record*, the Year-Book published by the Royal Veterinary and Agricultural College, Copenhagen.

In consequence of the decision of Council on the occasion of the Newcastle Congress that papers to be presented to Congress should be printed in the same form and size as the *Record* and separately from the Congress Handbook, the Committee has had under consideration the form to be taken by those portions of the Handbook remaining after the deletion of the papers.

The Committee recommends that the present form of Handbook be retained, subject to the deletion of the papers, but with the inclusion of a synopsis of each paper of not more than 250 words, to be supplied by the author, two blank leaves for notes to be inserted between each synopsis.

The motion for the reception and adoption of the report was seconded by Colonel Simpson and carried unanimously.

Finance and General Purposes Committee. Colonel Simpson (Chairman) read, and moved the reception and adoption of, the following report :—

Two meetings of the Finance and General Purposes Committee have been held since the date of the last quarterly meeting of Council.

The services of Messrs. Fowler, Langley & Wright, as legal advisers to the Association, have been retained for a further twelve months on the same terms as for 1928.

The Committee has decided to continue for the present year the Association's membership of the National Horse Association of Great Britain.

Much time has been devoted to the consideration of questions raised by members for the payment of whose outstanding membership subscriptions the Committee has been pressing. As it appeared from some of the letters received that the terms and conditions of membership of the Association were not fully understood, an Editorial on the subject was recently published in the *Record*.

In addition, it was decided to ask the Solicitor to prepare a summary of those Articles of Association and By-laws more particularly affecting individual members. The Committee has received and approved this summary and recommends to the Council that it be published in the form of a pamphlet and issued to all existing members and to every new member. Several quotations have been obtained for the printing of this pamphlet, and it is estimated that the cost of the requisite number of copies would be £3 12s. 0d.

The Revenue Account and Balance Sheet for the year ended 31st December, 1928, and the Auditor's Report thereon, have been considered and approved for presentation to the Annual General Meeting.

The Hon. Treasurer supplemented the report with a detailed statement concerning the finances of the Association for the quarter, which showed that at March 31st, 1929, there was a balance in hand of £655 1s. 8d. and liabilities amounting to £320 5s. 10d.

The Council then accepted the motion for the adoption of the report of the Committee.

Joint Sub-Committee re Office and "The Veterinary Record." The report of this Sub-Committee was read by the Chairman (Major Dunkin), when it was agreed :—

(1) That the report be circulated to all members of Council and discussion upon it deferred until the next quarterly meeting of Council, upon the agenda of which it should be placed ;

(2) That paragraph (E), relative to the cost of production of the *Record*, be put into operation forthwith.

The President : The report has not been received, so the Sub-Committee remains in existence.

Appointments Committee. The following report of this Committee was read by its Chairman (Professor Macqueen), who moved its reception and adoption :—

The Appointments Committee met at 10 Gray's Inn Square, W.C.1, on Tuesday, April 9th, under the chairmanship of Professor Macqueen.

The Minutes of the previous meeting, having been published in the *Record*, were taken as read and were signed as correct.

Certain confidential communications were considered and dealt with.

A communication was read from a member, seeking the support of the Association in his efforts to secure for himself and his assistant more satisfactory maximum salaries than those fixed for them under a revised grading scheme recently adopted by his local authority.

It was resolved to submit this member's letter to the Veterinary Officers and Public Health Committee with a view to the appointment of a Joint Committee to consider this communication in its relation to the whole subject of public appointments generally.

Attention was drawn to the advertisement appearing in *The Scottish Farmer* in which the Midlothian County Council invited applications for the post of Veterinary Officer.

The Committee determined that a letter be sent to the Midlothian County Council calling attention to the inadequate salary offered in view of the duties and responsibilities attaching to the appointment.

The Committee received the report of the Lovat Committee on the Colonial Veterinary Service.

The report was received and adopted, Professor Whitehouse seconding.

Organising Committee. Captain J. R. Rider read the report of this Committee, of which he is Chairman, as follows, and moved its reception and adoption :—

A meeting of the Organising Committee was held at 10 Gray's Inn Square, W.C.1, on Tuesday, April 9th, with Capt. J. R. Rider in the chair.

The Minutes of the previous meeting, having been published in the *Record*, were taken as read and signed as correct.

Arising from the minutes, correspondence with *The Field* was read concerning the omission of Major Dunkin's veterinary qualifications from articles on Distemper Research at Mill Hill which have recently appeared in the daily Press. In the course of his letter Mr. Moss Blundell said that, so far as *The Field* was concerned, great care had been, and would still be, taken to include Major Dunkin's qualifications in any references to him in connection with this work appearing in that journal. He also expressed his gratitude to the veterinary profession for the support received from it since the initiation of the work at Mill Hill and his anxiety to do anything further possible to meet the wishes of the Council.

This reply was considered satisfactory, and it was decided to take no further action in the matter.

A report was made of the items of information circulated to the Press during the past quarter. This was approved.

It was agreed that suitable material, selected and prepared in the office for the Press, should be sent to Divisions, who should be asked to use their influence in securing its insertion in local newspapers.

It was resolved to recommend to the Editorial Committee that an exchange should be effected between *The Veterinary Record* and *The North British Agriculturist*.

A letter was read which, with the approval of the Chairman, had been forwarded for publication in the *North-Eastern Daily Gazette*, in reply to certain misstatements made in that newspaper regarding the veterinary profession and Foot-and-mouth Disease research. The letter, however, had not been published.

The Committee approved of the action which had been taken in this matter.

Consideration was given to a communication from a member complaining that matters in which the veterinary profession have afforded assistance to research workers are being first of all communicated to, and discussed with, the agricultural community.

It was decided to thank this member for his communication and to say that efforts would be made to secure all such contributions for publication in the *Record*.

As a number of Divisions have yet to send in their views on the question of the establishment of a scheme of free veterinary treatment for sick animals belonging to the poor, it was agreed to await the receipt of these before dealing with the matter further.

The motion for the reception and adoption of the report was passed, Mr. NELDER seconding.

VETERINARY OFFICERS' AND PUBLIC HEALTH COMMITTEE. In the absence of the Chairman of this Committee (Mr. Male), the PRESIDENT (who acted as Chairman at the meeting concerned) read the following report :—

The Veterinary Officers' and Public Health Committee met at 10 Gray's Inn Square, W.C.1, on Tuesday, April 9th, when the President took the Chair in the absence of Mr. Male.

The Committee had before them a communication from a member forwarding a newspaper report of a meeting at which a member of a County Agricultural Committee was alleged to have quoted certain instances where valuable cattle had been slaughtered owing to the unreliability of the tuberculin test. The member considered that the statement was likely to do harm to the profession, and he suggested that the matter should be investigated by the N.V.M.A.

It was decided to ask this member for more particulars, and to leave further action in the hands of the Chairman of the Committee and the Secretary.

Consideration was given to a communication from a member drawing attention to an advertisement by a City Council for a Chief Sanitary Inspector, one of whose duties it was understood would be the carrying out of certain work in connection with the Contagious Diseases of Animals Acts. The writer felt that this would place the local Veterinary Officer in a subordinate position, and he desired the Committee to consider whether any action could be taken by the N.V.M.A. in the matter.

The local Veterinary Officer had been communicated with and, after considering his reply, it was agreed to place the matter in the hands of Major Rabagliati and Capt. Simpson.

A letter was submitted from the Secretary of the Western Counties Division enclosing correspondence that had followed a communication sent by him to the Ministry of Health pointing out that one of the members of an U.D. Council in that area was visiting farms with the medical officer of health and examining cows and cowsheds under the Milk and Dairies Order. The Division was not satisfied with the explanation which the local authority concerned had furnished to the Ministry, nor with the answer subsequently given by the Ministry itself to a point arising therefrom. A deadlock had been reached, and consequently it had been decided to refer the papers to the N.V.M.A., in the hope that the matter would be pursued by the deputation which would shortly visit the Ministry of Health in connection with the administration of the Milk and Dairies Order.

It was agreed to refer this correspondence to the deputation in question, and to request Mr. Nelder to secure any further information possible.

In regard to the letter *re* salaries referred to in the report of the Appointments Committee, it was agreed to co-operate in the formation of the suggested Joint Committee, the Committee to be Messrs. Male, Macqueen, Coleman and Rabagliati, with the following Terms of Reference :—

To consider a communication from——— ——— in its connection with public appointments generally, the Joint Committee to report to both the Appointments and the Veterinary Officers' and Public Health Committees.

The PRESIDENT, having moved that the report be received and adopted, accepted Major Rabagliati's suggestion that the Council should proceed to appoint forthwith a Chairman of the Joint Committee to which reference was made therein.

The Council appointed Professor Macqueen, and adopted the report.

PARLIAMENTARY COMMITTEE. Mr. COLEMAN (Chairman) read this report, as follows :—

A meeting of the Parliamentary Committee was held at 10 Gray's Inn Square, W.C.1, on Tuesday, April 9th, with Mr. J. C. Coleman in the Chair.

The minutes of the previous meeting, having been published in the *Record*, were taken as read and were signed as correct.

Arising from the minutes, the following reply from the Royal College of Veterinary Surgeons was read :—

15*th January*, 1929.

Dear Sir,

I submitted to the Parliamentary Committee at its meeting on Thursday last the resolution contained in your letter of the 8th instant relating to witnesses' fees. I am to state that the matter has already received the consideration of the Council and that the information obtained by the solicitor to the Council was duly furnished to your Association in April, 1925. In the opinion of the Committee the question of securing adequate fees when acting as a witness in a court of law, is a matter for negotiation by the individual concerned.

Yours faithfully,
Fred Bullock,
Secretary.

It was reported that neither the Coal Mines (Protection of Animals) Bill nor the Protection of Dogs Bill had made any progress since the Committee last met, and that it

was now unlikely that either Bill would receive a second reading this Session.

Correspondence was read which had passed between the Secretary of the Royal College of Veterinary Surgeons and the R.S.P.C.A., in regard to the former Bill, together with a letter from Sir Robert Gower, M.P., the promoter of the Bill, saying that he entirely agreed with the contentions contained in the letter sent by the Royal College to the R.S.P.C.A., of which he was Chairman. It was understood from Sir Robert's letter that the Bill would be introduced again in the new Parliament, prior to which the amendments suggested by the Royal College would be made.

The Secretary submitted a print of a new Bill to amend the Law with respect to the exportation of horses (Exportation of Horses Bill, 1929, presented by Mr. Ammon). It was felt that this Bill called for no action on the part of the Association.

Joint Meeting of the Parliamentary and the Veterinary Officers' and Public Health Committees.—Mr. COLEMAN read the following report, which was received and adopted, on his motion, Professor WHITEHOUSE seconding.

A joint meeting of the Parliamentary and the Veterinary Officers' and Public Health Committees was held at 10 Gray's Inn Square, W.C.1, on Tuesday, April 9th, Mr. J. C. Coleman being in the Chair.

The Secretary intimated that he understood that the Local Government Bill had now passed through both Houses of Parliament and would shortly be placed on the Statute Book, and that the Local Government (Scotland) Bill was shortly to be read a third time in the House of Lords.

He reported that, as instructed, he had written to the Secretary of the West of Scotland Division asking for any concrete suggestions that the Division might have to make as to the manner in which it is thought that the N.V.M.A. can help the members of the Division who may be affected by the operation of the Scottish Bill, and that a reply had been received to the effect that the general feeling of the members was that no steps could be usefully taken by the Association at present.

A letter was received from the Secretary of the North of Scotland Division, on the same subject, stating that the members of that Division had decided to leave in the hands of the N.V.M.A. the taking of such steps as might be necessary to safeguard the interests of part-time veterinary officers who may be affected when the Bill becomes law.

The Committee received the following reply from the Royal College of Veterinary Surgeons :—

15th January, 1929.

Dear Sir,

I submitted to the Parliamentary Committee at its meeting on Thursday last the resolution contained in your letter of the 8th instant relating to the inspection of food, and am directed to reply that the matter of securing an amendment to the Public Health Act, 1875, Section 116, is already receiving attention. We are advised, however, that it would not be conformable with parliamentary procedure for any amendment to the Public Health Act, 1875, to be introduced into the Local Government Bill, 1928.

Yours faithfully,
Fred Bullock,
Secretary.

PROVISIONAL COMMITTEE. The SECRETARY read the ensuing report :—

17 Wellington Square,
Ayr,
5th April, 1929.

Dear Sir,

AYR CONGRESS.

For the information of the Council, I have to submit the following report of the progress made by the Provisional Committee in the arrangements for this year's Congress :—

The first meeting of the Committee was held in Perth in October, when Mr. D. Brown, Kilwinning, was appointed Chairman, and an Executive Sub-Committee elected consisting of nine members including the Chairman and myself ; one additional member has since been co-opted. Having fixed the date of the Congress, a general discussion took place on a number of suggestions put forward, but the whole question of preparing the Congress programme was remitted to the Executive Sub-Committee.

After three meetings of this Sub-Committee the draft programme was completed, and on being submitted to a meeting of the Provisional Committee last month was approved. As the programme has been published in the *Record*, it need not be repeated here.

It will be observed that it has been decided to open the Congress on Saturday again this year, but the Civic Welcome is delayed until Monday morning when the attendance will be larger, leaving only the Annual General Meeting for Saturday afternoon.

In view of the Congress being held in Scotland the Scottish Branch decided to hold no annual meeting in October this year, and only to hold a formal business meeting during the Congress ; this meeting will be held at the close of the Annual General Meeting.

With reference to the papers to be submitted to the Congress, it was decided to limit these to five, and to deal with one each forenoon, leaving the afternoons free for outings, etc. ; the decision to devote a whole day to operations and demonstrations, however, necessitated a slight alteration in that original plan, and two papers will be discussed on Thursday forenoon. The papers have been chosen with a view to interesting all sections of the profession, and the Committee feel they have been fortunate in securing the services of those members who have undertaken to contribute papers and open discussions.

After due consideration it has been decided to continue the " Popular Lecture " for another year. The Hon. Godfrey Corbett, the President of the Ayrshire Cattle Herd Book Society, has promised to take the chair, and the local Press has promised to do what is possible to interest the farming community and ensure a good attendance. The day and hour of the lecture have been arranged to suit the convenience of farmers attending Ayr Market.

It is still too early to give any details of the programme for " Operations Day." The services of several surgeons have been promised, and, provided suitable subjects are available, an interesting programme is assured, while several novelties are being arranged in the way of demonstrations.

The social side of the Congress is being catered for in a manner which, it is hoped, will compare favourably with other Congresses.

A short motor outing is being arranged for Sunday afternoon ; it is hoped to visit Culzean Castle, the residence of the Marquis of Ailsa, but this is not yet definitely fixed.

Instead of the usual evening reception by the Provost or Mayor of the town where the Congress is held, the Corporation have arranged an outing to Alloway, where members will have an opportunity of visiting the Burns' shrines.

It will be observed that there is no whole-day motor tour this year ; instead, a delightful run of about seventy-five miles through the finest scenery in South Ayrshire has been arranged for Thursday afternoon. In the course of this excursion Glenapp Castle, at Ballantrae, will be visited, by kind permission of Lord Inchcape.

Two stock inspection outings, which it is hoped will prove of interest, are included in the programme. Mr. Kilpatrick's showyard successes in recent years are indicative of the class of Clydesdales to be seen at Craigie Mains, while the herds of Ayrshires to be visited on Friday are being selected with the assistance of the Herd Book Society, and will be representative of the best herds within easy reach of Ayr.

The evening functions, in addition to the President's Reception and the Banquet, include one on the opening and one on the closing evening of the Congress ; the latter will take the form of a whist drive and dance ; the character of the former is, as yet, undecided.

For Tuesday evening it is now arranged to run an Amateur Dramatic Entertainment on behalf of the funds

of the Victoria Veterinary Benevolent Fund. The Ayr Amateur Players have undertaken to assist, and it is possible that another famous company of amateurs may also take part, but it will be some time before the full programme can be announced. It is hoped that this innovation will meet with the approval of the Council. I feel sure that the standard of this entertainment will be a surprise to many who have not been in touch with the rapid progress made by the Community Drama Movement in recent years.

Ample facilities are being arranged for golf and other games; already permission has been obtained for members to play over the best two golf courses in the district, one being the famous Championship Course at Prestwick.

While nothing has been arranged for the ladies so far, they have not been forgotten and suitable arrangements will be made for their entertainment during the sessions of the Congress.

According to the preliminary notices issued by the L.M. & S. Railway regarding holiday traffic, return tickets to Ayr will be issued on Fridays at the single fare and a third, from English stations at any rate, available for eight to sixteen days. As soon as available, full particulars regarding these cheap fares will be sent to the *Record*.

Yours faithfully,
A. Douglas,
Local Secretary.

The PRESIDENT: I think I may safely move that the report of the Provisional Committee be received and adopted. (Applause.)

RESOLUTIONS FROM DIVISIONS.

(i) *From the Lancashire Division* :—

"That, in the opinion of this Division, no alteration, addition or deletion be made to any of the existing Articles of Association of the National Veterinary Medical Association unless the said alteration, addition or deletion has been passed by the requisite majority at an Annual General Meeting of the Association, or alternatively, such alteration, addition or deletion has been referred to the Divisions and a majority of the Divisions is in favour of such alteration, addition or deletion."

The PRESIDENT: The Solicitor's suggestion, which does not necessitate any change in the Articles of Association, is that we should, in a manner of speaking, give an honourable undertaking that we shall not call an Extraordinary General Meeting on any matter that involves alteration, addition or deletion in connection with the existing Articles without submitting the question to the Divisions.

Professor MACQUEEN: I propose that the Lancashire Division be thanked for their resolution and assured that no alteration shall be made without carrying out that procedure.

The SOLICITOR: There is this about it, that before any Article can be changed a special resolution has to be passed either by an Extraordinary General Meeting or the Annual General Meeting, and every member has to receive notice of that resolution; therefore, every member is given notice of what is going to be done.

Major DUNKIN: In other words, the divisions are, at the present time, protected by our Articles of Association.

The PRESIDENT: I think we will follow Professor MacQueen's suggestion and reply to the Division accordingly.

(ii) *From the Mid-West and South Wales Division* :—

"That the Council of the Mid-West and South Wales Division have given the subject of the present designations under the Milk (Special Designations) Order, 1923, their very careful consideration, and are in agreement with the resolution, viz. :—'That the re-naming of the grades of milk is urgently necessary, as there is much evidence to show that the public regards the term 'Grade A' as indicating the highest grade obtainable,' passed at the Public Health Congress at the Agricultural Hall, Islington, on November 21st, 1928.

"This Council further suggests, that the Council of the N.V.M.A. should refer this subject to all the Divisions for consideration with a request that their decisions thereon be sent to that body."

The PRESIDENT: We had a discussion on this subject at the last Council meeting, when it was deferred.

Captain R. SIMPSON: When this matter was discussed I told the Council that the official attitude to this question on the part of the Ministry of Health, who are responsible for these designations, is that there is no uniformity amongst the people concerned, and that until they get a uniform statement as to what names are approved by all the interests involved they will not make any alteration.

Mr. COLEMAN: Might I ask if the Minister of Health has made any other remarks since the time to which Captain Simpson refers, as I am given to uuderstand that the position has since altered considerably. The Minister said that he was prepared to receive a deputation if sufficient reasons were brought forward. Since that period the Clean Milk Society and two or three others have brought this matter very forcibly before the various associations and the public. In the North of England, I understand, there are very few "Grade A (Tuberculin Tested)" or "Certified" farms—practically all produce the "Grade A" milk only. In the South we have many such, but a number of these are discontinuing the work, which many of us have made great efforts to promote. This unfortunate position is the result of the poor support accorded by the public to those who produce the higher grades of milk, their ignorance being traded upon by the producers of "Grade A," who tell the public that it is the best milk there is, and, with such a designation, it is not surprising that this is believed to be the case. There is a great feeling in the South that "Grade A" is a most unfortunate aud misleading designation for such milk. (Hear, hear.) I think that the latter part of the resolution need not be considered any further: at the time that was suggested it had not been before the Divisions, but most of them have considered the matter now and I think that immediate action is necessary. I should like the resolution passed somewhat in this form, so that it may be submitted to The Certified and Grade A (Tuberculin Tested) Milk Producers' Association in Conference at Reading on Thursday: "That the Council of the N.V.M.A. most heartily give their full support to the resolution passed at the Public Health Congress at the Agricultural Hall, Islington, on November 21st, 1928, 'That the re-naming of the grades of milk is urgently necessary as there is much evidence to show that the public regards the term "Grade A" as indicating the highest grade obtainable.'"

I think it would be a retrograde step to cut out "Grade A" milk, but that the designation of clean milk should be clearly explained to the public, who should not be left to believe that "Grade A" is tested in the same way as the higher grades. If we do not support this demand for re-designation, these higher grades will fall out, and all that we have done in the last thirty years to obtain clean milk will fall to the ground.

I sincerely hope you will give this matter your most serious consideration, and carry a resolution which will give the Conference your support next Thursday.

The PRESIDENT: What is the feeling of the meeting?

Major RABAGLIATI: Are we going to send forward that resolution without suggesting anything better as designations? My own feeling is that the methods of producing milk are gradually being improved, so that it is becoming increasingly likely that "Grade A" will die a natural death. I quite agree that "Certified" milk should be given greater prominence, and there will be no harm in sending this resolution if we cannot give a more definite lead as to designation.

Mr. COLEMAN: I purposely avoided making any suggestion as to the lines on which the alterations in designation should be made, in order that we might first of all decide whether or no there should be an alteration. I left that point simply because I did not want to complicate matters.

Captain SIMPSON: It is no use sending a resolution to one section of clean milk producers, and I think, for that reason, that a general resolution is not going to do very much good, unless you also put forward a definite suggestion from the Council as to how these various designations should be altered.

The PRESIDENT: Have you a suggestion?

Captain SIMPSON: The simpler, the better—"A," "B" and "C" is much the best way, but they will not agree to that.

The PRESIDENT: I am going to put it to you that we send to the Conference at Reading an expression of our agreement with the resolution passed at the Public Health Congress at Islington, on November 21st, 1928, to the effect that the re-naming of the grades of milk is urgently necessary, as there is much evidence to show that the public regards the term "Grade A" as indicating the highest grade obtainable.

The Council intimated unanimous assent.

(iii) *From the Mid-West and South Wales Division*:—
"That the Council of the N.V.M.A. should, in the interests of the profession, consider what action could be taken to induce manufacturers to supply Veterinary Biological Products to qualified Veterinary Surgeons only."

(iv) *From the Western Counties Division* (in support of the above):—
"The Western Counties Division supports the resolution of the Mid-West and South Wales Division urging the N.V.M.A. Council to consider what action could be taken to induce manufacturers to supply Veterinary Biological Products to qualified Veterinary Surgeons only, and desires strongly to emphasise the danger of such products getting into the hands of laymen as they do at the present time."

The SECRETARY read certain confidential correspondence in connection with the resolution from the Mid-West and South Wales Division.

The HON. SECRETARY: I do not think we can do anything in the matter, Sir.

The PRESIDENT: It would be interesting to know what these Divisons would suggest as our line of action.

Mr. Nelder: ——— (specifying a commercial house) is the firm that is aimed at. Nearly all the other firms have come into line in this respect, and they publish in the *Record* that the sale of their veterinary biological products is restricted to veterinary surgeons. I do not see why ——— could not do likewise.

The PRESIDENT: It is the line of action that worries one. What action can we take?

Major RABAGLIATI: Arising out of this, here is a cutting I noticed the other day. It seems to me that the first thing to do is to stand by your profession and not help the ordinary lay public to carry out veterinary work. The cutting is taken from the *Farmer and Stock-breeder* for March 4th, 1929, and is as follows:—

THE DOUBLE INTRADERMAL TUBERCULIN TEST.

"Is the double intradermal tuberculin test one which an amateur can perform, and if so I should like some particulars.—F. R. B. (Lincs.).

"No doubt any intelligent person experienced with stock could carry out the actual injections satisfactorily after a little practice, but the correct reading of the resutls requires experience. The special syringe and needles may be bought for about 25s. to 30s., and the special tuberculin at about 1s. a dose; but I do not advise you to attempt this test without first getting your veterinary surgeon to show you just how it is done. It is not an operation that can be learnt from a description.—Vet."

If a veterinary surgeon writes this in an agricultural paper, what will the firms who manufacture these articles and products think of us? Will they be encouraged to restrict their sales to veterinary surgeons? It seems to me that first of all the whole profession must hang together.

Colonel P. J. SIMPSON: This subject was discussed by the R.C.V.S. (when considering the Dangerous Drugs Act) and it was found that we could not move in the matter.

Captain TOWNSON: I move "That no action can be taken by this Council in the matter."

The motion was seconded by Mr. ROBERTS and carried *nem. con.*

The meeting concluded with the passing of a vote of thanks to the President for his conduct of the proceedings.

From The Veterinarian, April, 1828.

Worm in the Urethra of a Dog.

M. Seon, Veterinary Surgeon to the Lancers of the Body Guard, was requested to examine a dog straining in vain to urine, often uttering dreadful cries, and then eagerly licking the penis. After having tried in vain to abate the irritation, he denuded the penis for the purpose of endeavouring to pass an elastic bougie, when he perceived a conical body half an inch long protruding from the urethra, with each effort of the dog to avoid his urine, and immediately afterwards returning into the urethra. He seized it with a pair of forceps, and drew out a worm much resembling the strongylus, and 4½ inches long. It was living and its movements were very active. A domestic, who held the dog, was frightened by the contortions of the worm, so that M. Seon could not ascertain its species. He only saw that its intestines were filled with a white fluid. The worm being extracted, the urine flowed, and the dog soon recovered.

NOTES AND NEWS.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events.

Aug. 31st to Sept. 6th.—N.V.M.A. Congress at Ayr.

April 29th.—Meeting of the Editorial Committee, N.V.M.A., 10 Gray's Inn Square, W.C., 4-30 p.m.
„ 30th.—Last day for payment of Annual Fees to R.C.V.S.
May 2nd.—Meeting of the Central Division, N.V.M.A., 10 Red Lion Square, W.C., at 6-30 p.m.
„ 3rd.—Annual Meeting and Dinner of the Lancashire Division, N.V.M.A., at the Midland Hotel, Manchester.
„ 9th.—R.C.V.S. Council Election—Last day for Nomination of Candidates.
„ 18th.—Entries due for D.V.S.M. Examination.
„ 23rd.—R.C.V.S. Annual Report and Voting Papers issued.
„ 30th.—R.C.V.S. Council Election—last day for receipt of Voting Papers.
June 6th.—R.C.V.S. Annual General Meeting.
„ 17th.—D.V.S.M. Examination commences in Edinburgh.
July 3rd.—R.C.V.S. Annual Dinner.
„ 4th.—R.C.V.S. Committee Meetings.
„ 5th.—R.C.V.S. Council Meeting.
„ 9th.—R.C.V.S. Written Examinations.
„ 11th.—R.C.V.S. Oral Examinations begin.

Personal.

Illness of Professor Wright.—We are glad to be able to inform our readers that Professor J. G. Wright, of the Royal Veterinary College, who, as reported in our issue of April 13th, was suddenly taken ill and admitted to the Middlesex Hospital, suffering from an indefinite abdominal affection, is now doing well and has left the hospital.

. . . . . .

Newmarket U.D.C. Appointment.—At a recent meeting of the Newmarket Urban Council a letter was received from Mr. G. W. Kerry, M.R.C.V.S., resigning his appointment as veterinary surgeon to the Council on account of failing health. The resignation was accepted with regret. Mr. Brayley Reynolds will take up the duties at once. Major Griffiths expressed the regret of the Council at receiving Mr. Kerry's resignation.

R.C.V.S. Obituary.

Marshall, Charles W., Farnham, Surrey. Graduated, London, 7th July, 1885. Died, 19th April, 1929, aged 66.

Army Veterinary Service.

London Gazette—War Office—Territorial Reserve of Officers.

April 23rd. Maj. R. Finch, M.C., F.R.C.V.S., from Active List, to be Maj. (April 24).

CORRESPONDENCE.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.
All correspondence must bear the name and address of the contributor for publication.
The Editor does not hold himself responsible for the opinions of his correspondents.

"Milk Fever and the Nervous Forms of Distemper and Hysteria in Dogs."

To the Editor of The Veterinary Record.

Sir,—Although I have not the advantage of being a member of the veterinary profession, I have followed with great interest the discussion in your columns on what Professor J. McCunn is reported to call "sleeping sickness," a name almost necessarily reserved for Trypanosomiasis. He goes on to say: "when a person talked about sleepy sickness he thought one understood that he was describing a disease of dogs which resembled sleeping sickness in humans." I venture to suggest that this view is held by no-one else. Sleepy sickness is a colloquial term, rendered necessary by the label-loving urge of the unscientific public. It does not really apply to more than a moiety of cases of encephalitis, many of which suffer from insomnia. But it has a certain convenience when we wish to refer to the clinical picture of nervous disorders plus the pathologic picture of perivascular "infiltration." It is commonly used in that sense and I would beg of Professor McCunn that he will not insist on making confusion worse confounded by introducing the English synonym (it may also be Caledonian, I don't know) for Trypanosomiasis.

When the worthy Professor suggests that it is strange that Mr. Spicer saw no sleepy dogs although living only ten miles from Mr. Pugh, one regrets that his ignorance of local topography, and hence epidemiology, cannot be corrected with the only suitable instrument, to wit, a claymore. I can myself bear witness that the picture of human sleepy sickness (of which, like Professor McCunn, I have "fairly considerable" experience) was frequently reproduced by dogs under the care of Mr. Pugh. I saw those dogs and Professor McCunn did not. They were certainly cases of what any clinician would call encephalitis. It may be that they were also cases of distemper, as Professor McCunn suggests. In that case encephalitis has of late years been a somewhat frequent complication, sequel or aspect (I dare not give away points to so doughty an adversary) of distemper, as it has been of certain other diseases in the realms of human medicine. That seems a perfectly rational view, according well with the teachings of epidemiology, and if Mr. Spicer likes to talk of distemper, and Mr. Pugh of encephalitis, they have every right to do so without any "interposition, interpretation or correction" (O, beauteous phrase, O, bonny Scotland) from anyone else.

I do hope I have not been too critical, but I would plead with scientists to leave the names alone for a while. First catch your virus and then name him. In the meanwhile, assemble facts rather than criticisms. That was the purport of the teaching which I had from a revered Professor. He, indeed, was obliged to use names like the rest of us, but he did not confuse them with facts.

Yours sincerely, Gordon Ward.

Oastfield House,
Sevenoaks, Kent.
April 15th, 1929.

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To the Editor of The Veterinary Record.

Sir,—In your correspondence column of April 13th, Mr. J. F. D. Tutt says, while writing on hysteria in dogs, ". . . . . the great majority of cases of true hysteria often follow the feeding of some of the various hound meals and dog biscuits of questionable value and content." In this connection details of the following cases may be of interest.

(1) Mr. M. has a kennel of five sporting dogs which were free from hysteria until the arrival of a new consignment of biscuits. Within three days of starting to feed with these biscuits all five dogs were affected at least once with hysteria. A Collie belonging to a neighbouring

shepherd, on being fed with biscuits from the same lot, was also affected.

(2) Mr. L. has two Spaniels and a Retriever which were all affected in a short space of time with hysteria, these dogs being at the time fed on biscuits. For three weeks Mr. L. fed his dogs on oatmeal porridge, and they remained healthy: at the end of this time he reverted to biscuits, and two days later all the dogs were again affected.

These and other similar cases would tend to support Mr. Tutt's remarks, but I cannot but think that I have seen the condition in dogs which were not fed on biscuits or hound meal. I should mention that the biscuits in both the above instances were supplied by reputable firms, and not by the same firm.

With regard to the treatment of hysteria, many lines are advocated, and each sedative has its champions: my view is that all lines are equally harmless and that *vis medicatrix naturæ*, coupled with quietness is as beneficial as any.

It would be unorthodox to close any communication to your columns at this time without some reference to milk fever. My experience is limited, but I have already met with it in cows fat and lean, heavy and poor milkers, milk cows and cows suckling calves, and cows at various stages up to two months after calving. I have not yet seen it in a first or second calver, but I do not consider this as proof that it is never met with in such. No matter what type of cow I am dealing with, and irrespective of the time elapsed since calving, I find it very convenient to call the condition "milk fever" if it responds to udder inflation. The latter treatment alone I find sufficient: drenching—with anything—I think is to be deprecated as not only unnecessary but possibly dangerous.

A post-parturient condition which worries me much more than milk fever is post-partum paralysis. If any practitioner can supply me with a speedy and efficient cure for the cow which, after calving, lies down and for days eats, drinks, ruminates, defæcates and is normal in every way except that she will not rise to her feet, he shall have my heartfelt thanks.

Yours faithfully, H. C. WATSON.

Blairgowrie,
Perthshire.
April 21st, 1929.

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TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—In the concluding portion of his letter on hysteria in dogs, Professor Gorton refers to the "prescribing of proprietary articles of more or less unknown composition by practitioners." As, in my last letter, I mentioned a preparation of Savory and Moore's that is sold under the name of "Fructole Bromide," I conclude that he is making a veiled reference to this. For his own information, he may be interested to know that the composition is well known, and is from the prescription of the well-known specialist on nervous diseases, Dr. Risien Russell. I quite agree with Professor Gorton about the desirability of overhauling canine posology, but why not go further, and produce a really authoritative work on veterinary materia medica as a whole? At present there is no up-to-date and reliable work. I am glad that he is not a supporter of the organism theory as the cause of hysteria. A great deal of nonsense is being written and talked about animal diseases as a whole, and although in some instances this is a source of financial advantage to some of our members who ought to know better, in my opinion, it reflects no credit on the profession to which they belong.

This remark does not apply to the subject now under discussion.—Yours faithfully, J. F. D. TUTT, M.R.C.V.S.

1 St. Cross Road,
Winchester.
April 22nd, 1929.

Veterinary Posology. Proprietary Medicines.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—In your issue of April 20th, Mr. B. Gorton mentioned the importance of a thorough overhauling of canine posology and also the matter of the prescribing by practitioners of proprietary articles of more or less unknown composition.

Both of these topics appear to be of sufficient general interest for Mr. Gorton and others to express their views thereon. The dosage of drugs to cats is also worthy of attention. Inasmuch as the *written* word, even of a tyro, makes a big impression on some minds, it is advisable that any revision should be made by authorities officially recognised by the veterinary profession.

The question of the prescribing of proprietary medicines of unkown composition also merits discussion, especially in view of the fact that the *Veterinary Record* has recently permitted its columns to be used by practitioners for testifying to the virtues of Odylen as a remedy for certain diseases. Yours truly, G. W. CLOUGH.

Royal Veterinary College,
London.
April 20th, 1929.

Sidebone and Lameness.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—Mr. J. P. Railton draws attention to a very interesting point; I, too, have been in horse practice—mostly hunters and bloodstock—for over thirty years, and have never yet seen a horse lame from a sidebone that could be felt, but that does not mean that sidebone in a certain stage is never a cause of lameness.

The fact that the initial centre or centres of ossification of the lateral cartilage is or are below the coronet, is the probable explanation.

During the time that ossification of that part of the cartilage within the foot is going on, lameness will be almost certain to occur, and this is the probable explanation of many an obscure lameness of the foot, when nothing can be seen or felt, and the only possible method of locating the seat of the trouble is by an injection of cocaine over the region of the plantar nerves.

When the process of ossification is so far complete, so that the change in the cartilage can be felt above the coronet, the trouble is over, the parts have become adapted, and the horse will never again be lame from that sidebone, for even when the process is complete it is plain that a piece of upstanding bone clear of everything can never cause lameness.

The change from cartilage to bone is more or less a natural process, and continues throughout life in almost all parts of the body.

I have known many hunters with big upstanding sidebones that stand their work well, season after season.

GERALD BLOXSOME.

Rosemullion,
Southwick,
Sussex.

Johne's Disease.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—We are pleased that Mr. Stableforth asks for further information on the outbreak of Johne's disease in a herd which was investigated by us a short time ago.

The outbreak was reported because four features were worthy of note:—

(1) The necessity for careful differential diagnosis between cases of suspected sewage poisoning and Johne's disease.
(2) The short period which elapsed in this outbreak between the onset of symptoms of Johne's disease in the affected animals.
(3) The value of the Johnin test.
(4) The cessation of spread of the disease on disuse of the polluted drinking pond.

Answering Mr. Stableforth's questions, the herd referred to consisted of 8 cows and 12 young animals ranging from 6 months to 3½ years, five of which were lost, and one cow which gave a positive Johnin test reaction is still alive.

Most of the remaining animals are on the premises at present. All the animals were reared on the farm, and kept under the same conditions since the autumn of 1927

after the young animals returned from the rented grazing, all being housed for the winter and allowed out to drink at the suspected pond daily.

There is no doubt in the mind of one of us (T.C.F.) that no case of Johne's disease had existed at this farm for many years, as he was conversant with all illness in the herd, and the owner's support is given that any sick animals were reported to Mr. Fletcher for investigation. We therefore presume that the animals which left the farm during the summer of 1927 and developed the disease on return to the premises either contracted infection at one or other of the rented premises where they went during the summer, or, leaving the origin of infection obscure, that the polluted water supply acted as a predisposing factor, causing the disease to become progressive. Infection having thus been added to the pond once the disease became progressive, infecting the other animals. On disuse of this pond and the elimination of the affected animals—with the exception of the cow referred to above, which is still in the herd, and remaining in good condition—the disease has been arrested.

Further explanation of this outbreak might be offered: that there is the possibility that Johne's bacilli are inhabitants of the bacterial flora of the normal ruminant's intestine, some factor being necessary before they set up lesions.

In support of this, the pond was full of filth which was disturbed on entry of the animals. Moreover, the experimental results mentioned by Mr. Stableforth—that 1,000 mgms. of artificially-cultivated bacilli only caused lesions in less than 50 per cent. of animals inoculated. This shows that some animals, at least, can harbour the organisms.

The disease is a very serious one in some districts, and the renewed interest taken by members of the profession is a tribute to the value of Major Dunkin's stimulating research work. It is hoped that light may be thrown on the obscure etiology of the disease by field workers.

Observation is being kept on the herd in question; the Johnin test will be re-applied to detect if further infection occurs on these premises and a further report made.

Yours faithfully, TOM C. FLETCHER,
WILLIAM TWEED.

Sheffield.
April 22nd, 1929.

(i) Hæmorrhagic Septicæmia; (ii) The Burdizzo Castrator.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—I am writing you in regard to two matters of interest to veterinary workers in India and recently mentioned in your columns.

(i) Hæmorrhagic septicæmia.

In your issue of March 9th, Major Allen says: "The vaccine is not advocated during an outbreak, as for a period of four days following the inoculation of the vaccine the animal is still susceptible to the disease."

In these provinces, during the past season, vaccine and sera have been used in all outbreaks where the cattle owners were willing for inoculation to be performed. The vaccine is injected on one side of the body and the serum on the other, although that is a minor detail.

It is found that it is easier to persuade the Indian cultivator to have his animals inoculated when the disease is actually present in the village. Some three or four thousand animals have been thus protected during the months July, August and September, 1928, and I have received no complaints of any resulting fatalities.

In the same way, although the attempt is made to get as many animals as possible protected against black-quarter before the onset of the season, during the past year aggressin and serum simultaneously have been used in actual outbreaks without any reported untoward happenings.

(ii) The use of the Burdizzo castrator.

This castrator has been in use in these provinces since 1921-22. Its great advantage in India is that the animal is emasculated without the shedding of any blood, which renders the open method objectionable to certain castes of Indians.

During the time since the Burdizzo was introduced the number of castrations has risen from about twenty thousand to sixty thousand a year. In 1927 the number was about sixty thousand and in 1928 about fifty-eight thousand. The steady rise in numbers is good evidence that the method is efficacious, and its popularity is further demonstrated by the fact that, in some districts, Indian landlords have presented this type of castrator to the local hospital or dispensary.

In the beginning some reports were received that sexual excitement was displayed some months or weeks after the operation. On investigation it was always found that the result was the fault of the operator. This usually occurred through one testicle being allowed to slip out of the instrument to one side. In the past year or two no reports as to inefficient sterilisation have been received.

Other than this, we have had a very few cases where the skin has been cut, due to using the edge of the jaws and not holding the cord in the centre of the instrument, with the formation of a nasty wound which has been found, on occasion, difficult to treat.

We have had two claims made for compensation for limbs being fractured, during casting, in the years under reference.

As the average Indian cultivator is very suspicious of new methods, especially when introduced by Government, I think we should have heard about it had the results of the use of the Burdizzo been other than completely satisfactory.

The only objection I have to the instrument is that it works loose at the four nuts. I have recently had made, locally, at the cost of about sixpence a time, some double spanners for use in tightening the nuts from time to time. I have also a suspicion that to ease the working of the instrument, some of the subordinate staff deliberately loosen the joints, but of course one cannot cope with that.

Yours, etc., R. F. STIRLING.

Nagpur,
Central Provinces,
India.
April 4th, 1929.

Zurich Congress of the Royal Institute of Public Health.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—May I trespass upon your valuable space to remind members of the profession that the Congress of the Royal Institute of Public Health will be held at Zurich at Whitsuntide (May 15th—20th)?

For the first time at these Congresses there is to be a Section of Veterinary Medicine and Meat Hygiene under the Presidency of Professor J. Share Jones and Professor Frei, of Zurich, and a strong programme, which will be published shortly, is assured.

Anyone wishing to become a member of the Institute and attend the Congress may do so on payment of a fee of one guinea—write to the Secretary, Royal Institute of Public Health, 37 Russell Square, W.C.1. Travelling arrangements are in the hands of Sir Henry Lunn, Ltd., who will furnish particulars on enquiry.

I shall be glad if members of the profession who are going to Zurich will kindly let me have their names as early as possible.—I am, Sir, Yours faithfully, HOWEL V. HUGHES
(*British Secretary, with Mr. R. L. Higgins, of Veterinary Medicine and Meat Hygiene Section*).

The University,
Liverpool.
April 23rd, 1929.

The Editor acknowledges the receipt of the following:—

Report of a meeting of the V.M.A. of Ireland, from Professor J. J. O'Connor, Hon. Secretary.

Report of a meeting of the Derbyshire Division, N.V.M.A., from Captain O. V. Gunning, Hon. Secretary.

Communications from Mr. R. E. Glover (Cambridge), Professor D. C. Matheson (Edinburgh), Dr. A. L. Sheather (London), Messrs. J. S. Steward (Hereford) and O. Stinson (Appleby).